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Report of the Superintendent of Public Instruction

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Report of the Superintendent of Public Instruction 1876; and

… Biennial report of the Superintendent of Public Instruction, State of Colorado 1877/1878-<1879/1880>, <1883-1884>-1889/1890

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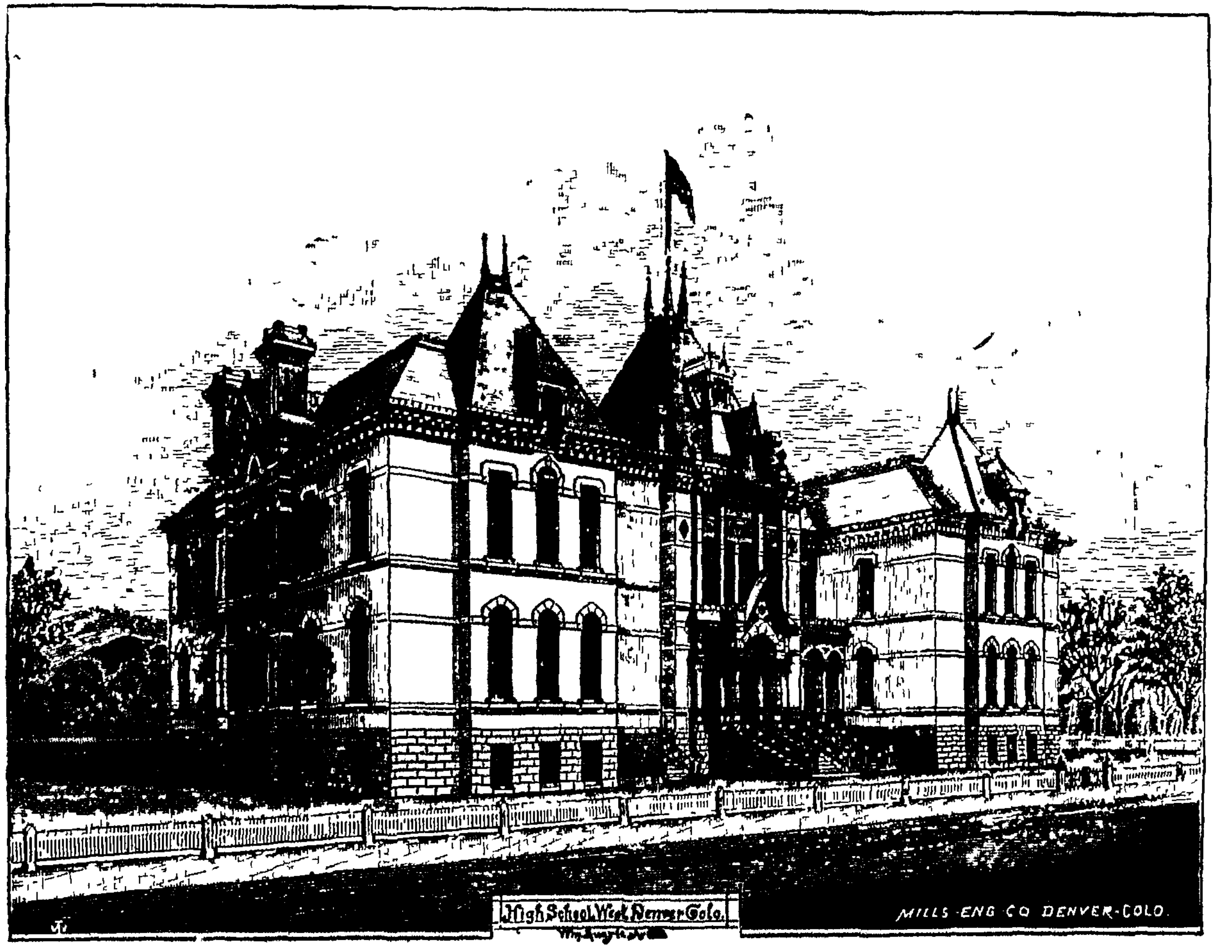
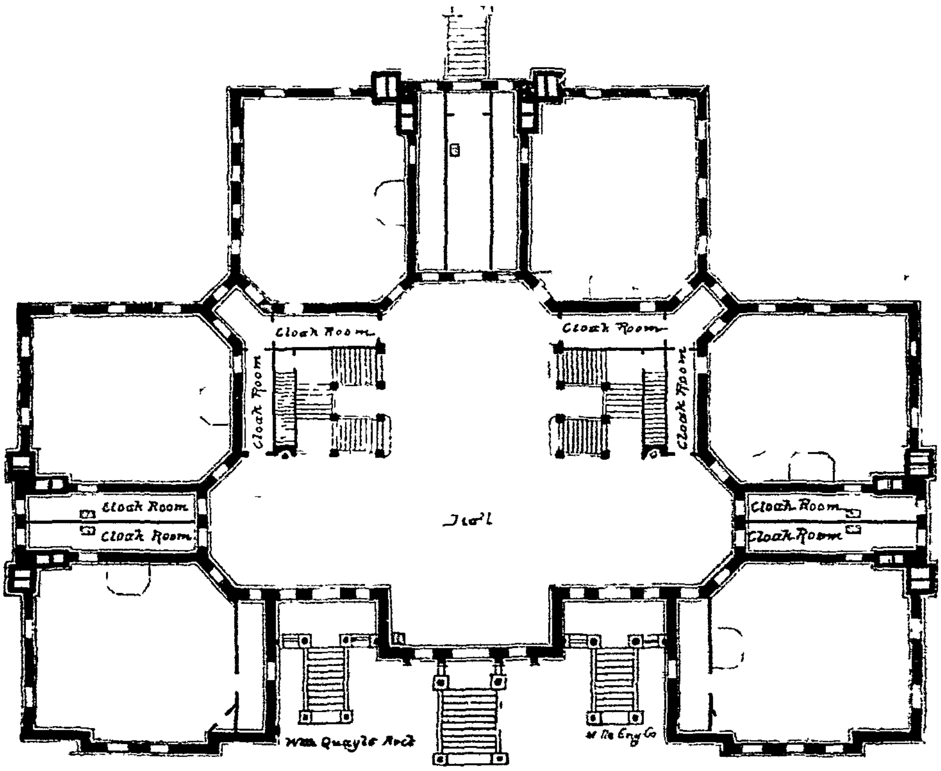
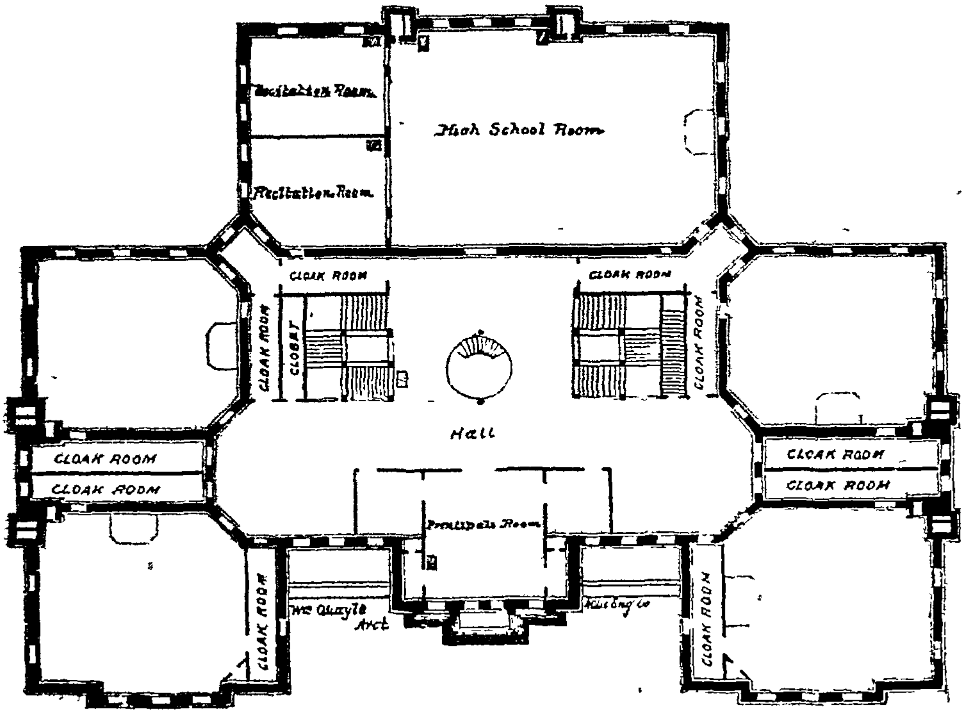

High School, West Denver Colo.
MILLS-ENG CO DENVER-COLO.

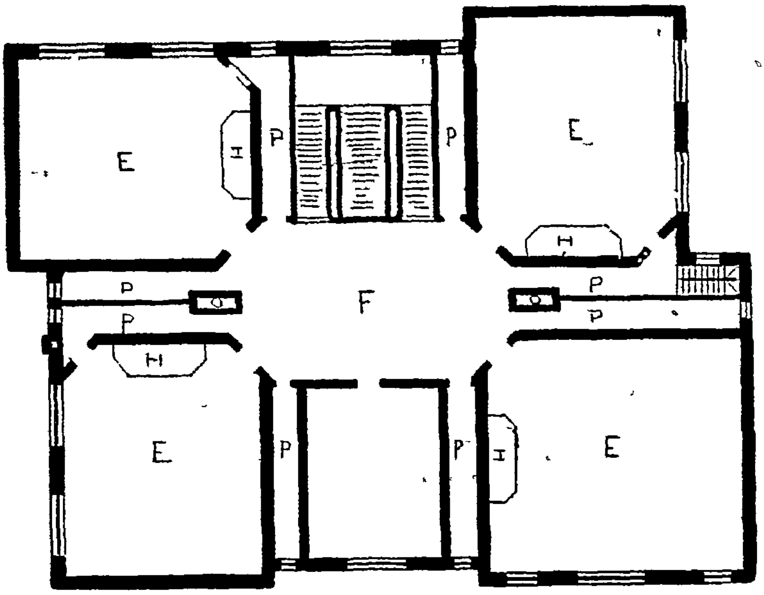
FRANKLIN SCHOOL, WEST DENVER.
Plate 1 See Page 44



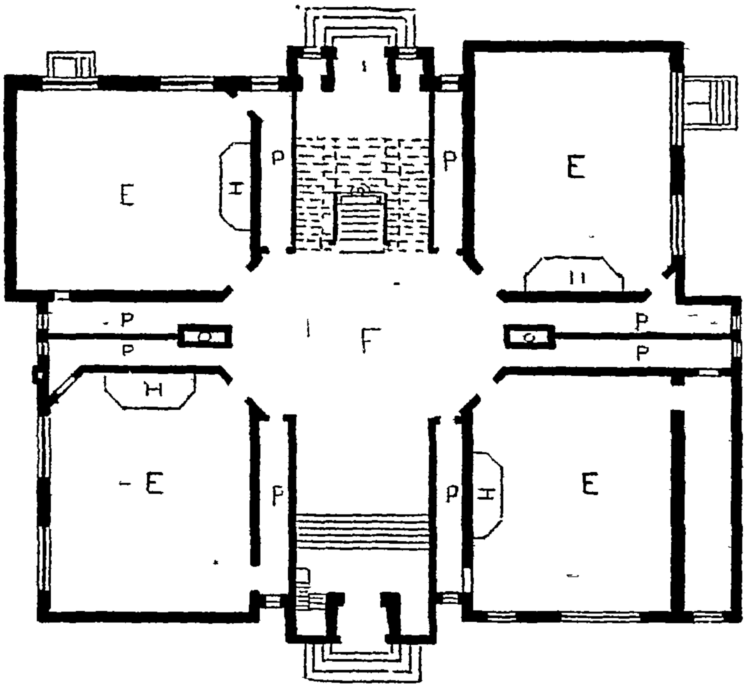
FIRST FLOOR.



SECOND FLOOR.
FRANKLIN SCHOOL
Plate 2. See Page 44.



SECOND FLOOR



FIRST FLOOR.

EMERSON SCHOOL.

E—Schoolrooms. F—Halls P—Cloakrooms. H—Teachers' Platforms

Plate 3, see page 44

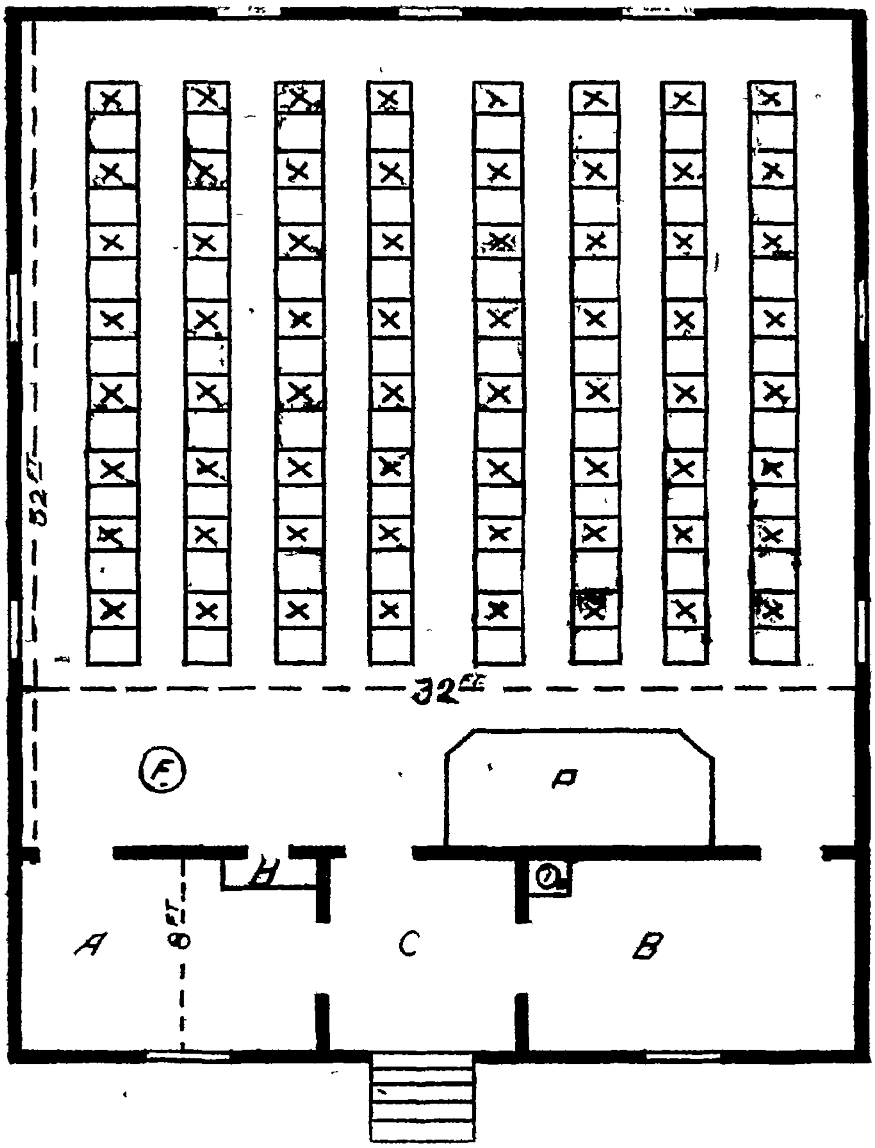


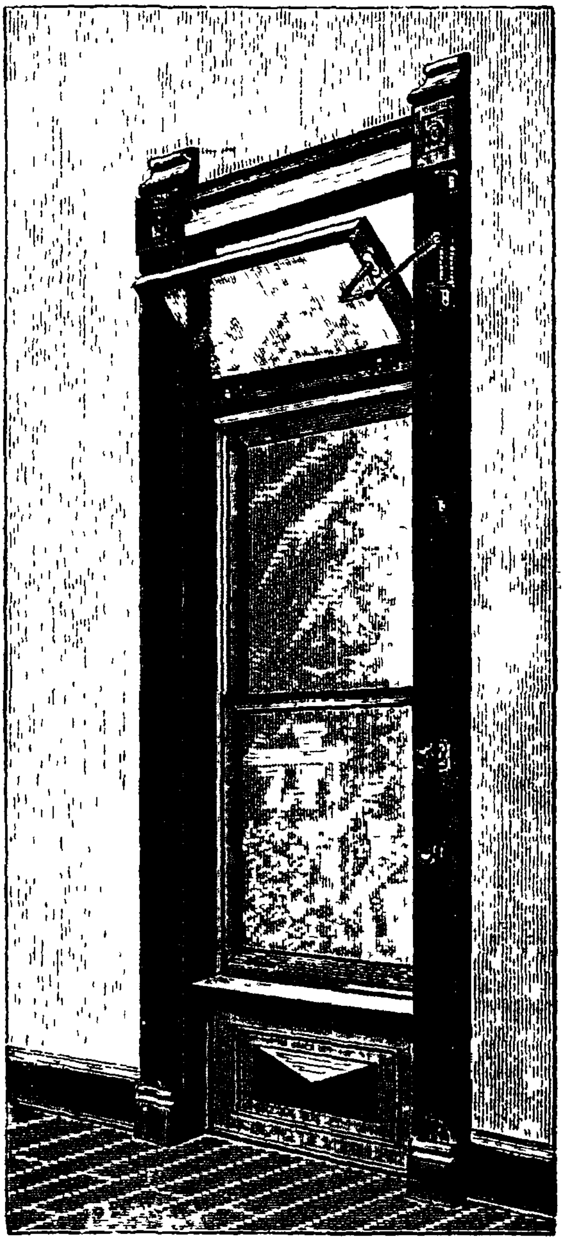
DIAGRAM OF SCHOOL ROOM WITH SINGLE DESKS FOR SIXTY-FOUR SCHOLARS.

A—Boys' Wardrobe
B—Girls' Wardrobe.
C—Vestibule.
E—Ventilating Flue.

F—Stove
H—Teacher's Closet
I—Smoke Pipe.
P—Teacher's Desk.

Aisles between Desks, 16 to 20 inches.
Aisles next to the walls and middle aisle, 24 to 30 inches

Plate 4. See Page 45.



INSIDE VIEW OF WINDOW SHOWING HOW TRANSOM SHOULD BE HUNG.

Plate 5. See Page 46

FOURTH

BIENNIAL REPORT

OF THE

Superintendent of Public Instruction

OF THE

STATE OF COLORADO,

FOR THE

YEARS ENDING AUGUST 31, 1883, AND AUGUST 31, 1884.

TO THE GOVERNOR.

DENVER, COLO.
TIMES PRINTING COMPANY, STATE PRINTERS,
1884

23780
12-30-96

STATE BOARD OF EDUCATION.

1883 TO 1885.

JOS. C. SHATTUCK,
Superintendent of Public Instruction.

MELVIN EDWARDS,
Secretary of State.

D. F. URMY,
Attorney General.

1885 TO 1887.

L. S. CORNELL,
Superintendent of Public Instruction.

MELVIN EDWARDS,
Secretary of State.

T. H. THOMAS,
Attorney General.

STATE UNIVERSITY,

BOULDER.

BOARD OF REGENTS.

	TERM EXPIRES.
Max Herman	1887
Jos. C. Shattuck	1887
James Rice	1889
L. S. Cornell	1889
R. W. Woodbury	1891
C. M Tyler	1891

FACULTY.

Joseph A. Sewall, M.D., LL.D., President,
Professor of Chemistry and Metallurgy.

Isaac Dennett, A. M.,
Professor of Latin

Paul H. Hanus, B.S.,
Professor of Mathematics.

Mary Rippon,
Professor of German and French.

James W. Bell, Ph.D.,
Professor of Political Economy and History.

W. F. C. Hasson (Assistant Engineer U. S. Navy),
Professor of Mechanics and Applied Mathematics.

J. Raymond Brackett, Ph.D.,
Professor of English Literature and Greek

William R. Whitehead, M D.,
Professor of Anatomy and Surgery

Charles Ambrook, M.D.,
Professor of Theory and Practice of Medicine.

James H. Kimball, M.D.,
Professor of Physiology, Materia Medica and Therapeutics.

Thomas H Everts, M.D.,
Professor of Obstetrics and Diseases of Women

H. W. McLauthlin, M D.,
Professor of Pathology and Histology.

George Cleary, M.D.,
Professor of Opthalmology and Otology.

W. H. Mershon,
Licensed Instructor in Music.

Edward C Wolcott,
Librarian.

STATE SCHOOL OF MINES,

GOLDEN

BOARD OF TRUSTEES.

	TERM EXPIRES.
C. C WELCH	1885
JAMES T. SMITH	1885
FREDERICK STEINHAUER	1887
R H. VAN DIEST	1887
E. L. BERTHOUD	1887

FACULTY.

REGIS CHAUVENET, A.M., B.S, President,
Professor of Chemistry and Assaying

ARTHUR LAKES,
Professor of Geology and Drawing. Curator of the Museum.

MAGNUS C. IHLSENG, E.M., C E., Ph D.,
Professor of Physics and Engineering.

PAUL MEYER, Ph.D.,
Professor of Mathematics.

GEO. C. TILDEN, C.E.,
Assistant in Assaying

STATE AGRICULTURAL COLLEGE,

FORT COLLINS.

BOARD OF TRUSTEES.

	TERM EXPIRES.
B. S. LaGrange	1891
W. F. Watrous	1891
John J. Ryan	1889
Henry Foote	1889
David Boyd	1887
Ozro Brackett	1887
R A. Southworth	1885
G. W. Rust	1885

FACULTY.

C. L. Ingersoll, M.S , President,
Professor of Political Economy and Logic.

A. E Blount, A. M.,
Professor of Agriculture and Superintendent of Farm

C. F Davis, M.S.,
Professor of Chemistry and Physics

Elwood Mead, B.S., C. E ,
Professor of Mathematics and Engineering

James Cassidy,
Professor of Botany and Horticulture.

J. W. Lawrence,
Professor of Mechanics and Drawing.

G. C. Faville, B.S., D.V M.,
Professor of Veterinary Science and Zoology.

STATE INDUSTRIAL SCHOOL,

GOLDEN.

BOARD OF CONTROL.

	TERM EXPIRES.
J. FRANK GARDNER	1885
W. B. OSBORNE	1885
W. G. SMITH	1887

W C SAMPSON,
Superintendent

RACHEL B SAMPSON,
Matron

A. W. EXTROM,
Family Father of Family One and Teacher.

ED. L. HEALEY,
Family Father of Family Four and Teacher.

I. M. SIBBET,
Assistant in Family One and Teacher.

J H. WILLIAMS.
Foreman of Broom Shop and Assistant

CHAS. A COBB,
Bookkeeper.

L. M. RHOADES,
Charge of Shoe Shop and First Night Watch.

ANTONIA KLEIN,
Baker and Second Night Watch.

C. M. COBB,
Charge of Laundry and Teacher.

J. M. WRIGHT,
Charge of Kitchen and Officers' Dining Room

R. B. FISK,
Charge of Boys' Dining Room and Officers' Quarters.

RHODA CARPENTER,
Charge of Tailor Shop.

DEAF-MUTE AND BLIND INSTITUTE,

COLORADO SPRINGS.

TRUSTEES.

	TERM EXPIRES.
Dr. R. G. Buckingham, President	1885
Charles H. White, Secretary	1885
Dr. James Correy, Treasurer	1885

EDUCATIONAL DEPARTMENT.

D. C. Dudley,
Principal.

H. M. Harbert,
A. J. Lamoreaux,
Mrs. A. Whitcomb,
Miss Lizzie Kirkpatrick,
Teachers.

Mrs. C. C. Wynn,
Teacher of Blind Class.

Miss M. E. Churchman,
Teacher of Vocal and Instrumental Music.

DOMESTIC DEPARTMENT.

Mrs. A. O. Whitcomb,
Matron.

Miss Mary Harbert,
Girls' Supervisor

Collins Osgood,
Boys' Supervisor

Robert Magee,
Engineer.

INDUSTRIAL DEPARTMENT.

H. M. Harbert,
Teacher of Printing.

Miss G Sutton,
Teacher of Needle-Work.

DEPARTMENT OF PUBLIC INSTRUCTION,
D[illegible]VER, COLO., Dec. 10, 1884.

To his Excellency,

JAMES B. GR[illegible]

Gov[illegible] Colorado:

I have the honor to tr[illegible]it herewith the Fourth Biennial Report of the Superintendent of Public Instruction, for the biennial term ending August 31, 1884.

Very respectfully,

JOS. C. SHATTUCK.

SYNOPSIS
OF THE
Public School System of Colorado.

OFFICERS.

Superintendent of Public Instruction.
State Board of Education.
County Superintendents.
District Boards.

SCHOOLS.

Ungraded District Schools.
Town and City Graded Schools, with
High School Courses.

HIGHER AND SPECIAL SCHOOLS.

University, Boulder.
School of Mines, Golden.
Agricultural College, Fort Collins.
Mute and Blind Institute, Colorado Springs.

OTHER AGENCIES.

State Teachers' Association, voluntary.
County Teachers' Association, voluntary.

SCHOOL AGE.

Between six and twenty-one, attendance voluntary.

SCHOOL YEAR.

Begins September 1, ends August 31.

SUPERINTENDENT OF PUBLIC INSTRUCTION.

Elected by the people for two years. Has general supervision of the public schools; collects and tabulates the school statistics of the State; apportions the State school fund to the counties; gives information to school officers upon construction of school law; prepares and furnishes blanks for use of school officers and registers for teachers; visits annually such counties as most need his personal attendance, inspecting schools and making public addresses; is President of the State Board of Education and a member of the State Board of Land Commissioners; makes biennial report to the Governor, in December previous to each session of the Legislature; causes school law to be published and distributed in pamphlet form; is *ex-officio* State Librarian.

STATE BOARD OF EDUCATION.

Consists of Superintendent of Public Instruction, Secretary of State, and Attorney General.

Issues State diplomas to such teachers as may pass examination, after having taught successfully in the State for two years; tries appeals from the decision of County Superintendents, but cannot render a judgment for money.

STATE BOARD OF EXAMINERS.

The Superintendent of Public Instruction, the President of the State University, the President of the Agricultural College, and the President of the State School of Mines, constitute a State Board of Examiners, having entire control of the examinations for State diplomas.

COUNTY SUPERINTENDENTS OF SCHOOLS.

Elected by the people for two years. Compensation five dollars per day, and fifteen cents for each mile necessarily traveled, but such compensation may not exceed one hundred dollars in one year for each school in the county; holds quarterly examinations for teachers and grants certificates to successful applicants; apportions the county school fund to the districts; visits each district at least once each quarter while school is in session, for the purpose of inspecting the schools, advising with teachers and school officers, and examining the books and accounts of the latter, to see if the same are properly kept, and the district funds accounted for; receives reports from district secretaries and makes report annually to Superintendent of Public Instruction; hears appeals from decisions of district boards; supplies districts and teachers with copies of the school law and all needed blanks and registers; is Land Commissioner of the county.

DISTRICT BOARDS.

In districts of the first class: *i.e.*, those which have a school population of more than 1,000, the district board is composed of six directors, two of whom are elected annually on the first Monday in May, and hold office three years They elect one of their number president, a secretary who may be a member of the board, and a treasurer who may not be a member of the board. In all other districts, the board consists of three members, term three years, one elected each year. These district boards are the executive officers of the districts, which are bodies corporate, created by law

The directors are custodians of the district property of all kinds; they employ and discharge teachers and laborers, and fix the salaries of the same; make rules for the government of the schools, and prescribe the course of study and the text-books; suspend or expel pupils; disburse all school money, keep district records; take school census; report annually to County Superintendent; enforce the rules and regulations of the Superintendent of Public Instruction, and in general do all things necessary to carry on the schools.

In districts with a school population of 350 or more, the directors fix the amount of the special tax levy, if any, for school purposes, in smaller districts the question is submitted to a vote of the people.

The Constitution of the State provides, "That no person shall be denied the right to vote at any school district election, or to hold any school district office on account of sex."

SCHOOLS.

No district is entitled to any portion of the State or county fund unless it maintains a school, taught by a licensed teacher for at least sixty days in each year. In the county districts schools are maintained from sixty to one hundred and sixty days, sometimes prolonged even to two hundred days. In cities and towns the schools are from one hundred and twenty (in a few) to two hundred days in length; those in which is enrolled a majority of the pupils of graded schools are in session at least one hundred and ninety days; while those in which is enrolled a majority of the pupils of ungraded schools are in session about one hundred days.

All the graded schools have a High School course open to all, while Denver is the only city sufficiently populous as yet to require a High School with a full and entirely distinct faculty.

HIGHER AND SPECIAL SCHOOLS.

Separated, as the people of Colorado are, by so many miles and so much cost of travel, from the institutions of learning in the older States, they early saw and felt the necessity of providing for the advanced education of the youth of the State at home, since the majority are effectually debarred from attending elsewhere.

Out of this necessity sprung the University at Boulder, the Agricultural College at Fort Collins, and the School of Mines at Golden, all supported by the State; all, of course, yet in their childhood, but all vigorous and promising, in charge of teachers of experience and skill, and with courses of study which compare favorably in breadth and thoroughness with similar institutions in the older States.

The University is controlled by a Board of Regents, six in number, two of whom are elected biennially by the people.

The Boards of management for the other institutions are appointed by the Governor.

A tax of one-fifth of one mill is levied by the State for the support of each.

REFORMATORY INSTITUTIONS.

The State Industrial School at Golden is a reform school for boys. It has been managed from the first on the modern family plan, nothing prison-like in its appearance or its discipline, and its success has been gratifying.

SCHOOL REVENUE.

The Public School revenue of Colorado is derived almost exclusively from taxation. In common with other new western States, she has a land grant of sections sixteen and thirty-six in each surveyed township, but so large a portion of these fall upon arid lands that the grant is of little aid to our school fund. The statute provides for the annual levy of a county tax for school purposes of not less than two nor more than five mills; this, with the proceeds of penal fines constitutes the county school fund. To this is added whatever may be received from the State fund, which, during the past year, has amounted to sixty-one cents per capita of the school population. For the year ending August 31, 1884, nineteen counties levied the minimum rate, and of the remaining twenty which exceeded it, two reached the maximum.

The State fund will be materially increased hereafter by the amount received from the Insurance Department.

In many States there is a "Teachers' Wages Fund," which cannot be used for any other purpose. There is no such fund known to the laws of Colorado. What is known as the "General Fund," derived, as above stated, from the county tax, from fines and estrays, and from the State fund, is available for all legitimate expenses of the district, except purchasing sites, erecting and furnishing buildings, making permanent improvements or betterments. The proceeds of a Special School tax, when collected, are practically added to the General Fund, because available for precisely the same purposes. The excess of the Special Bond tax, if any, after paying the interest coupons due, can be used for the same purposes. None of these moneys can be used for building, enlarging, or furnishing school houses, or purchasing sites, except the unexpended balance remaining to the credit of the district any year, after paying the expenses of a ten months' school for that year. Repairs rendered necessary by the ordinary wear and tear of the buildings can be paid from this fund. If a district is to build, enlarge, furnish, or purchase site, it must tax itself for that purpose. There is no statutory limit to the rate of taxation which a district may vote, either for school or building purposes, and in districts of first and second classes it is the duty of the board to fix the rate, and the board may also order the levy of one tenth of a mill to be expended for a library.

SUGGESTIONS

FROM

COUNTY SUPERINTENDENTS.

DELTA COUNTY.

Geo. H. Merchant, Superintendent.

The school interests of Delta county are rapidly increasing. The districts have increased in number from 3 to 8 since my last annual report. During the year there have been 4 schools in session; one 7 months, two 6 months, and one 3 months. District No. 1 has voted $7,000 bonds for the purpose of building and furnishing a school house. It will be located at Delta, the county seat, will be of brick, and will be built and furnished in modern style. In the districts recently organized, none of them have less than 17 persons of school age, and all expect to have school the coming winter. We find that the maximum rate of taxation as fixed by law—5 mills—for the General fund, will not support schools in these new districts as long as the people desire. If the maximum were fixed at 10 mills, and the rate then left to the judgment of the County Commissioners, the needs of the people in sparsely settled counties would be better served.

CHAFFEE COUNTY.

John G. Hollenbeck, Superintendent.

School district No. 14 has completed a fine brick house this year. The Salida district is building one, and it will be ready for occupancy about December 1st. District No.

16 expects to build next year. The teachers in this county have held no institute this year. It seems to be an impossibility to get 25 teachers to even promise to attend on account of the expense. It is probable that a teachers' association will be formed during the holidays, the expense attending it being small on account of the shortness of its duration. I have been unable to attend to my official duties as I should have done, on account of the expense and the low price of county warrants. I think it is not right for County Superintendents to work for nothing and board themselves. The school district officers of this county are generally good business men, and are careful not to employ incompetent teachers, frequently consulting with the Superintendent before hiring them. During the year four new Districts have been organized, viz: one at Monarch, No. 21; one at Calumet, No. 22; one at Divide, No. 23; and one near Salida, No. 24, the latter having been organized since September 1st.

CUSTER COUNTY.

Artemas Walters, Superintendent.

Most of the schools in this county during the past year have been ably conducted by a class of teachers well qualified for their work, and many of them are using the latest methods and text books in their schools, while every teacher in the county reads one or more educational journals. Some of the Districts are very large and sparsely inhabited, hence some of the pupils have a great distance to go to attend school, making the attendance in such Districts very irregular, and the average small. Without a special tax for school purposes, thinly populated Districts cannot maintain a school longer than three months in a year. Other Districts, by levying a special tax, maintain a school from 6 to 10 months in a year, and have some very fine and well furnished school buildings, which are a credit to the people who have built them. All Districts in this county but two have school houses, and those two use very comfortable rooms, the use of which is donated. We are taking steps towards holding a Teachers' Institute the coming year. I have visited every District in the county several times, and found a lively interest manifested in regard to schools, and the holding of longer terms. It has been my endeavor to foster and increase the interest among the people, and above all, to have teachers in charge of our schools who understand their business, and who *teach* instead of *keep* school

ELBERT COUNTY.

S. J. Stid, Superintendent.

I am in hopes the Legislature will appropriate Elbert county enough money to hold a Teachers' Institute at least 1 week every year. Our schools are in rather a backward condition for this age of rapid progression. We have just organized a graded school at Elbert, which will undoubtedly be a success.

EL PASO COUNTY.

B. A. P. Eaton, Superintendent.

I think section 16 of school law should be so amended as to require School Boards in Districts of the first class to hold examinations for teachers who expect to be employed in said Districts, on or about the 10th day of June in each year; and that said examination shall be conducted just as the county examination is; the District Secretary to report the result to the County Superintendent upon blanks prepared for that purpose, within 10 days after said examination closes. Also, an additional clause to section 61, forbidding members of the several School Boards from drawing warrants on the County Treasurers in favor of themselves, except for their pay as members of the Board. Also, another, prohibiting members of School Boards from contracting to build or furnish school houses.

GUNNISON COUNTY.

Geo. B. Spratt, Superintendent.

A marked improvement has been perceptible in the educational work during the past year. Notwithstanding the hard times several new school houses have been built, one at a cost of $8,000; another, a frame, in course of erection in District No. 3. One new district organized since last report. There has been an increase in the school population of over 5 per cent.; in the "average daily attendance" of 10 per cent. Teachers are doing good work. Although the directors are doing more to promote the interest of education in their Districts than heretofore, I regret very much to say that most of them have been extremely tardy in sending in their annual reports, as required by law. A large majority of those reporting were incorrect! I have been compelled to go to a number of districts and make out their reports myself, which has consumed time and caused a great deal of unnecessary expense and trouble, therefore I hope you will excuse the unavoidable delay, on my part, in not reporting to you at an earlier day. District officers experience no little inconvenience in the matter of settling up and keeping a correct cash account with County Treasurer, for the reason, when they are about to create an indebtedness or issue an order for the payment of the same, they are at a loss to know just what amount of cash on hand, etc., until the close of the year, because the law does not require the County Treasurer to render a statement of balance on hand each quarter, but simply to report the amount collected. Most school officers are, therefore, apt to overdraw their accounts. I think the school law of the State should be revised so as to place the funds, as fast as collected, in the hands of the District Treasurer.

HUERFANO COUNTY.

A. H. Quillian, Superintendent.

I am satisfied that there is a constant improvement in school work in this county. New methods are being adopted in some of the schools with marked success. There is also a growing disposition to house the schools. We have in this county a large per cent. of Mexican children—in a few districts the school population is entirely Mexican. With this class of people there is a very decided improvement in the interest evinced by the parents concerning the education of their children.

LARIMER COUNTY.

W. H. McCreery, Superintendent.

In addition to the tabulated annual report this day forwarded, I would submit the following items in regard to the progress of school work in this county during the past two years. In that time the number of Districts has increased from 26 to 35, while the increase in school population has been only about 14 per cent.; in the valuation of property in the county about 36 per cent. The increase in the value of school buildings has been more than 50 per cent., while the amount received by the schools from the General and Special Funds, together, has increased from $10,782.96 in 1882, to $23,590.10 in 1884, an increase of over 100 per cent. The liberality with which the people vote and pay heavy taxes, in some cases as high as 35 mills on the dollar, for building houses and maintaining schools, shows that the work of education occupies no second place in their hearts As a class our teachers are devoted and earnest. In August, 1883, I organized a Normal Institute, which continued in session two weeks, with very satisfactory results. In this work I acknowledge gratefully the help received from yourself and from Professors of the University, Agricultural College, and others. In August of this year a similar session was held. To make these Normal Institutes what they should be we need State help. These sessions were attended by about three-fourths of the teachers employed in the county, although the attendance was entirely voluntary on their part and at their own expense. You will notice that the average salary of female teachers in the ungraded schools of the county is a little higher than that of males. And so the world moves. May the system of school we are building up help to move it right.

OURAY COUNTY.

P. H. Shue, Superintendent.

I suggest that the School Law be so amended as to make it the duty of the County Judge (or Commissioners) to appoint an assistant to the County Superintendent in holding quarterly examinations of teachers, whose duties and powers shall be equal to those of the County Superintendent in examining and grading the answers of applicants. It might do away with much irregularity in issuing certificates. The law is now plain enough, but it is sometimes evaded.

PUEBLO COUNTY.

A. Y. Hull, Superintendent.

The public schools in this county during the past year were largely attended, and notably successful both in cities and country. The schools of Pueblo, under the superintendency of J. S. McClung, and those of South Pueblo, under F. B. Gault, will take rank with the best in the West; while the schools in the country have had the advantages of superior teachers as a rule, and the work has been very gratifying. All of our schools in the city and country, with few exceptions, have re employed the superintendents and teachers of last year, which is a sufficient guaranty of a successful school year.

RIO GRANDE COUNTY.

Sigel Heilman, Superintendent.

I predict more improvement in the educational work of this county during the coming year, than during any time in its past history. The better elements of society are rapidly settling in our little county, and they have already made their interest and influence felt in our educational work. The assessable property of the county is greater than ever before, and the School Boards are using more care in the application of school funds and the selection of teachers. The District Boards favor the regulation of teachers' wages by the grade of certificates ; and also, the adoption of a uniform series of text books. They will give their support to a measure for having all school books furnished by the State.

NOTE—See remarks elsewhere on text books.

SAGUACHE COUNTY.

W. E. White, Superintendent.

Educational facilities in the way of new buildings, furniture and improved apparatus, have been greatly increased during the year, and the efficiency of our schools has been much enhanced by the services of a higher grade of teachers, and the wider interest and effort on the part of patrons, and yet for the money expended the schools are not what they should be. Some of the districts lacked the small amount of interest necessary to elect a Board of Directors at the last election, and others elected men possessing so little interest in educational matters that they failed to qualify. Many of the districts possess no maps, globes or charts, all of which are indispensable to the highest success of instruction. The influences of relationship, friendship, or other extraneous circumstances, rather than true professional merit, has governed too often in the selection of teachers, who should be employed only because of fitness for the work. In order that our schools may be highly successful, patrons should take the deepest interest and see that only men who are qualified and will perform their duties are elected directors. Directors should pay teachers as high wages as possible, in order that they may fit themselves for the difficult duties of their profession. Patrons, and especially directors, should support and encourage teachers when they are doing their duty, and if they are *not* performing their duty and attaining reasonable success, they should be promptly discharged. School Boards will find that to attain the highest success, good maps, globes, charts and blackboards are indispensable, and the final result will justify their purchase, even if it is found necessary to shorten the school term.

Text books are being rapidly improved and should be changed as often as possible compatible with justice to those who buy. Teachers of proved ability and success should be retained in the same school as long as they are successful. Much valuable time is lost by the frequent change of teachers. Factional quarrels should never be permitted to interfere with the proper management of the schools. Permits, as well as certificates, are now issued only upon the strongest evidence of ability, and the grade of teachers is being raised as rapidly as possible.

Our State statutes in regard to Teachers' Institutes do not provide the assistance that our teachers should have. Many of the counties that are making an earnest and faithful effort to make the influence of the public schools felt in every home, have not 25 teachers to attend an institute; and a term of two weeks is too long, because entailing too much expense upon teachers whose work is limited to a few months in the year.

An interchange and candid discussion of methods of instruction and discipline is the greatest utility of a Teachers' Institute, and this can be accomplished perhaps nearly, if not quite, as well in two or three days as in two or three weeks, and with much less expense. We suggest that State aid should be given to procure competent and progressive instructors in new and improved methods of instruction and discipline, and whatever aid possible to maintain a live, energetic institute for a period of two or three days every fall in each county of the State; and we are satisfied that the increased efficiency of our schools would more than compensate for such expenditure. The profession of teaching, with a few individual exceptions, has grasped only half of its power for true advancement. The great majority of our teachers only increase power, without giving that power right direction. The teacher is truly successful—the country is truly safe—the future is truly secure, only when principle and intelligence are wedded together; and it is cheaper and less dangerous for the nation or State to pay good teachers and furnish means to that end, than to support the products and effects of moral and mental ignorance.

SUMMIT COUNTY.

B. A. Arbogast, Superintendent.

Our county is fast emerging from the chaotic condition incident to a floating population. All our school Boards have wisely consented to the adoption of a uniform system of text books. Our teachers and school officers are all working harmoniously, hence we look forward to a year of as prosperous school work as our limited finances will permit.

WELD COUNTY.

A. K. Packard, Superintendent.

I have secured, in seven or eight school houses, better arrangements as to light, ventilation, and entrances, than were to be found in the county before. One hindrance to the best success in some of our schools is the carelessness of school Boards in taking for teachers, simply because they apply, persons of whom neither they or any known to them, have knowledge, when they might easily obtain those of whose qualifications and successful experience they are or may be assured Sometimes Boards neglect to engage a teacher till they wish school to begin. Again; many Boards, paying a teacher good wages, never have any personal knowledge of the teacher's work, and so sometimes a really good teacher gets an ill reputation in a district, and a poor one is counted successful. In the former case the testimony of incapable and prejudiced or malicious pupils is taken without examination. In the latter the teacher has not given offense, and though inefficient, ignorant and unapt, the trustees commend the teacher by saying, "we hear no complaint."

I would beg leave to renew, or repeat, the suggestion in my last year's report, that the State should provide, by the appointment of a commission, or otherwise, to insure that no school house, great or small, should be built without certain conditions to secure sufficient and the best light and proper ventilation, for the lack of both which most of our teachers and scholars suffer, some consciously, but most without thought of it, and all wrongfully.

Is it not possible, and desirable, to lighten the burden that oaths and bonds lay upon school officers? In a county like Weld, in portions thinly populated, it is quite a serious question One secretary wrote me that he could not swear to his report without a journey that would cost $7.50, besides the time required, and the time is quite an important consideration in a busy season. A secretary has told me of going to a not near neighboring town to swear —of going the third time before finding the necessary notary or justice. It vexes the secretary to be at so much trouble to swear that he will do his duty, and then, every time he returns a census list or report, to go again to swear that he has done his duty. If he must make oath when he takes office, might not his certificate be sufficient for his census list and report? Treasurers sometimes grudge the time and trouble and expense of swearing and giving bonds for the delivery of their record book and copy of school laws to their successor.

REPORT

OF

SUPERINTENDENT OF PUBLIC INSTRUCTION.

There has been so marked an improvement in county reports for the present year, that the statistical tables for 1884 are the most reliable ever published for this State—in a number of the items are reliable for the first time, as I believe, since educational statistics were collected in this State or Territory. This is due, in part, to the fact that the people are becoming familiar with the working of the School Law, which has been subject to modifications rather than to radical changes since 1876, and the modfications have, for the most part, been to secure greater simplicity in the machinery necessary in district organization and management. It has been of advantage to the people that all changes in the law, since it was enacted by the first General Assembly of the State, have been in the shape of amendments to the various sections of the original law, and not by separate acts. The State Constitution wisely provides that when any section of a law is amended the entire section must be re-enacted as amended, hence the School Law of Colorado is complete in itself and does not require a digest.

The financial part of the county reports are now made with a near approach to absolute correctness. This is the result of the provision of law which keeps the district funds in the County Treasury, from which it is paid out for the lawful expenses of the district, and the further provision requiring the County Treasurer to report at the close of the school year to each district secretary the cash received, and paid out during the year on account of his district, and also to send to the county superintendent an abstract of the reports to the districts. This method enables the county superintendent to detect and correct any errors in district reports, and to make his own report to the Superintendent of Public Instruction correct, as it could not be by any other plan yet devised.

Some few district officers still object to the provision of the present law which makes the County Treasurer the custodian of the district funds, instead of the district treasurer, as formerly. I have made diligent inquiry whereever complaint has reached me, and have never found anything more serious than a little inconvenience, which is disappearing as the people become familiar with the present method. It is apparent to all thinking people, that the school funds are safer in the hands of one man, who is almost sure to be a skilled accountant, and behind whom is an ample bond, than it is when parceled out among ten, twenty or forty men, a majority of whom have little skill in accounts, and whose bonds, being in most cases for small amounts, are apt to be found worthless when put to the test of the courts. A well known citizen and banker, who has been treasurer of his county a number of terms, tells me he has repeatedly seen the three district officers come to his office, and, after receiving the district funds from the County Treasurer, *divide the money between themselves before leaving the room*, making no pretense of accounting for it. This is, of course, an extreme case, but every year money was lost to the schools, at different points. It was loaned on insufficient security; being in small amounts it was mixed with the treasurer's personal funds, and no account kept but his memory, hence at the end of the year, a report that contained any information of value was an impossibility; and so in one way and another, here a little and there a little, in all a large fraction of the School Fund of the State never benefitted the schools. Such leaks are well nigh impossible under the present law, and as a matter of fact are stopped.

EXAMINATION OF TEACHERS.

In 1877 questions for use in the quarterly examination of teachers were sent from this office to all county superintendents. From that time till 1881 the use of these uniform questions was tentative and voluntary, but so satisfactory that it was then incorporated into the law and made compulsory. It comes as near giving universal satisfaction as it is possible for any system which touches so many individuals. As the method of our examinations, and the rigor with which they are conducted, are matters of interest to very many people, at home and abroad, I publish the circular sent to county superintendents, rules to be furnished each applicant, and the questions used at one examination. The purpose of uniform questions would be but half accomplished unless there were also some approach to uniformity in the manner of using them and the grading of the answers. As the suggestions of the circular have been very generally followed, this publication puts the Colorado county examination clearly before the reader.

OFFICE OF SUPERINTENDENT OF PUBLIC INSTRUCTION,
DENVER, COLORADO.

Circular to County Superintendents concerning the Quarterly Examination of Teachers

GENTLEMEN: By virtue of law I am now required to prepare questions for your use in the quarterly examination of teachers. In sending these questions I desire to make the following suggestions as to their use·

These questions will be forwarded to you in sealed packages. I recommend that you open them on the morning of the examination, in the presence of the applicants There is work for two days of five or six hours each for the average applicant, and I recommend a two days' session, at least in the more populous counties Applicants should have time to do themselves justice Let it be understood by all, that to receive a certificate, the applicant MUST DO THE WORK at the time and in the manner prescribed for all If one can do it in half a day well,—but let it be known that a certificate will *never* be given for a part of the work Absentees must take the consequence of their own misfortune, however imperative the cause of their absence This is not given as a rule, but merely the plain statement of a fact.

By dividing the slips you can give out half a day's work at a time, and I urge this plan as much fairer to all than giving the topics singly, as some will gain time in one branch, others in another; but no applicant should be allowed to leave the room after seeing any questions, until such questions are answered, that there may be no opportunity or temptation to consult authorities

The topics are numbered from one to twelve. For the first day use Nos. 1 to 6 inclusive, second day, Nos 7 to 12 inclusive Take up questions and answers promptly at expiration of each session If you wish an oral examination, take sufficient time for that and for reading before or after the time allotted to the session

Do not take a *minute* of the session for general exercises, or *talk*, or allow any one else to do so

Take such *further time* as you wish to satisfy yourself as to the moral character of all applicants, and as to their experience in and aptitude for the business of teaching, and also time to give such counsel concerning their duties as you may think helpful.

For marking the applicants divide the topics into two groups: First group, Nos. 1, 2, 3, 5, 6, 10, 11 and 12; second group, Nos. 4, 7, 8 and 9. Give certificates as follows:

FIRST GRADE CERTIFICATE

First Group—Average 90 per cent.; no branch below 75 per cent
Second " " 75 " " " 60 "

SECOND GRADE CERTIFICATE

First Group—Average 75 per cent.; no branch below 60 per cent.
Second " " 60 " " " 40 "

THIRD GRADE CERTIFICATE

First Group—Average 60 per cent; no branch below 50 per cent.
Second " " 50 " " " 40 "

NOTE—A third grade certificate must not be refused on account of a failure in the Natural Sciences.

File and retain all answers, for your own protection Number the applicants, but take no names.

Give each a blank envelope and paper sufficient for the work Examine and grade all papers by number before opening the envelopes to learn the names. (If you can get a committee of competent persons to examine and grade the papers, it will guard you still further from any charge of unfairness, which disappointed applicants are apt to make.)

A high degree of practical success in teaching should be accepted as a sufficient reason for issuing a certificate of a higher grade than is warranted by the percentage upon examination, and inexperience or want of success should lower the grade of the certificate given, while failure as a teacher might be so marked as to make it your duty to refuse a certificate, whatever the percentage obtained

I earnestly recommend that certificates of the first grade be given only to teachers who have earned it by success in the school room as well as at examination. I also recommend the addition of ten to the grade earned on Theory and Practice, for the regular reading of some good educational periodical, or of one or more reliable books upon the subject.

Refuse certificates to applicants of whose moral character you have a reasonable doubt

Please report to me as soon as convenient after your examination, on the blanks furnished for the purpose, giving the names of all applicants

Preserve these instructions for future reference

Take great pains that none of the questions go out of your hands until the end of the quarter

No private examinations are lawful, except for temporary certificates, valid only till next public examination.

Respectfully yours,
JOS. C. SHATTUCK,
Superintendent of Public Instruction

RULES FOR THE CONDUCT OF THE EXAMINATION

(This slip is given to each applicant with the first questions).

*1. Provide yourself with a lead pencil.

2. Write your name, age, nativity, and postoffice address on a slip of paper, and answer the following questions·

1. How long have you taught, and where?
2. In what school or schools were you educated?
3. What educational papers or journals do you read regularly?

Place the answers in the envelope, seal it, and put your number, but not your name, on the back

3. Write your number on each paper.

4. Take a different paper for each branch write the subject at the head of each paper, and write on but one side of the paper.

5. Number your answers to correspond with the questions, but do not repeat the questions.

6 Read all the questions on a topic before answering any of them.

7. All communication during examination is absolutely forbidden.

8 *Do not take the questions from the room.* Any applicant who violates this rule will forfeit all right to a certificate.

9 When possible, abbreviate. Give short but complete solutions to arithmetical problems.

10. Ask no questions If you have doubts as to the meaning of any question, let them be submitted in writing, so that the Superintendent may examine them when he examines the answers to the questions

11 Omissions will be considered as failures, and in estimating your rank the general appearance of the papers as well as the correctness of the answers will be considered

*If the Superintendent conducting the examination *prefers* to have the work done with pen and ink, he will provide them.

QUESTIONS USED AT QUARTERLY EXAMINATION OF TEACHERS,

THIRD QUARTER, 1884

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1 ARITHMETIC.

Indicate the working of problems No credit for mere answers

1. On what principle does cancellation depend ? 10

2 Name the different kinds of common fractions, and illustrate by examples
3 off for each omission

3 Reduce $\frac{2\frac{1}{6}\text{ of }\frac{4}{22}\text{ of }5}{8\frac{1}{4}\text{ of }12}$ to a simple fraction Proc. 5, ans 5.

4 How much will 13⅓ tons of hay cost, at $17½ per ton. Proc. 5, ans 5

5 If 36⅔ acres yield 637 bushels of wheat, at the same rate what will 5¾ acres yield ? Proc 5, ans. 5

6 (049x 00049) ÷ (049—.00049) ? Proc 5, ans. 5.

7. What is the cube root of 12.812904 ? Proc. 5, ans 5

8 and 9 A commission merchant receives 24,000 pounds of pork, worth 6 cents per pound, and $3,000 cash, with instructions to invest both in United States 5 20s at market rates He charges 5 per cent both for selling and investing What is the amount of his commission ? United States bonds are that day quoted at 108⅜, and none are to be had of a less denomination than $50. How much does he invest, and what balance remains in his hands ?
Proc 10, ans 10.

10. I wish to borrow $400 from a bank for 30 days What must be the face of my note that when discounted at 6 per cent. I may receive this amount ?
Proc. 5, ans. 5

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2 UNITED STATES HISTORY AND CONSTITUTION.

1 Give an account of the Stamp Act 10

2 In what year, where, and by what American Commissioners was the treaty of peace at the close of the Revolutionary War negotiated ?
3 off for each error.

3. During whose administration did the War of 1812 occur, and what battle terminated it ? 2 pts 5 each.

4. Name the Presidents in their order, that filled the office for eight years ? 5 off for each error.

5 Name the nationalities that made early discoveries in America, and the parts of the country discovered by each. 3 off for each error.

6 Give the boundaries of the United States at the close of the Revolutionary War. 10.

7 What are the qualifications required by the Constitution for a Representative? Senator? President?

8. What kind of bills must originate in the House of Representatives? 8.

9 What is the substance of the Thirteenth Amendment to the Constitution? 10.

10. What part of Colorado formerly belonged to Mexico? 10.

3. READING

1. What particulars are embraced in the general term "Expression?" 10.

2. At what point in a child's reading do you first insist on proper expression? 10.

3. How many inflections are there? Name them, and show how they are indicated in books? 4 off for each error.

4. What inflection is used to express irony, sarcasm, derision and contempt? 4 pts 3 each.

5 Read the following sentence so that it will make a temperance speech and an anti-temperance speech.— 8.

> "The person who daily uses intoxicating liquor, if he does not become a drunkard, will be in danger of losing his health and character."

6 to 10. Read selections from Independent Sixth Reader:

1st, from "The Rim of the Bowl," page 255
2nd, from "Eloquence," page 325

If this Reader is not at hand, examiners will make other selections to test applicants in both prose and poetry, and give the last five credits according to the degree of proficiency shown

4. PHYSIOLOGY AND LAWS OF HEALTH

1. Name the subdivisions of the heart, and give the office of each. 10.
2. Describe the lungs. 10
3. What is ventilation, and on what does it depend? 10.
4. Define absorbtion, and explain the process. 2 pts 5 each.
5 Describe the ear, and state how the sensation of sound is produced. 10

5. PENMANSHIP

1. What is meant by principles? 10.

2 What is the object of the study and practice of principles in learning to write? 10

3. In what way may the teacher assist the pupil in obtaining a clear conception of the forms to be written? 10.

4. Write the loop letters Write the letters composed of the first and second principles. 6, 5.

5. Analyze a, m, h, y, d 5 pts, 2 each.

NOTE—Your writing in answering the above questions will be taken as a specimen of your penmanship, and marked 0 to 50.

6 ORTHOGRAPHY

1. How many syllables are there in every word? 10.
2. How many elementary sounds in our language? 10.

3. What is the rule for "e" final when suffixes are added? 10.

4. Give directions for the use of capital letters. 10.

5, 6, 7 8. Write the following words, and make all the corrections necessary, and mark the accent: Antilope, caff, cammell, iknuman, exchecker, lovable, secrecy, sibel, irascible. sintillation, susceptibility, cirsingle, intelligable, meretricious, tranquility, transendent. 0 to 20

7. SCHOOL LAW.

1. In what manner is the revenue raised for the support of the public schools of this State? 20.

2, 3. To whom must the teacher make reports, and what is the penalty for failure in this duty? 40.

4, 5. How may persons obtain a State Diploma in Colorado, and what is the character of such diploma? 40

8. BOTANY.

1, 2 Name the two grand divisions of Phenogamia or Flowering Plants, and give the leading characteristics of each. 40.

3. Define Inflorescence. Dehiscence. 2 pts. 10 each.

4 Point out the distinctive characteristics of herbs, shrubs and trees. 10.

5. What is a weed? An exotic? 2 pts. 10 each.

9 OTHER NATURAL SCIENCES.

1. What is Science? 10.

2. Define Solids and Fluids. Inertia. 3 pts 2½ each.

3 What is Newton's Universal Law of Gravitation? 10.

4. Define Organic Chemistry. Inorganic. 2 pts. 5 each.

5. How many chemical elements in nature? 10.

6. Give the leading characteristics of Mammalia. 10.

7, 8 Define Fragmental Rocks, Metamorphic Rocks, Calcareous Rocks and Igneous Rocks. 4 pts 5 each.

9. Describe the Solar System. 10

10. Who discovered the exact shape of the planetary orbits, and what is his first law? 2 pts 5 each.

10. GRAMMAR.

1. Give all the participles in both voices, of the verbs "to win" and "to lay." 10

2 Write a complex sentence in which the subject and predicate are each modified by a clause. 10.

3 State the difference between ellipsis and abridgment, and give an example of each. 10.

4. Correct the following, and give the reasons:

> "Each one did their duty."
> "The 'Pleasures of Hope' were written by Campbell"
> "Counties who fail to make returns will forfeit their portion of the public fund."

5, 6, 7, 8, 9, 10 Analyze the following, and parse the italicized words:

> " Every *hour that* fleets so slowly,
> Has its *task* to do or *bear*;
> Luminous the *crown* and *holy*,
> *When* each gem is set with care.
> *Do* not *linger* with regretting,
> Or *for* passing hours despond;
> *Nor*, the daily toil *forgetting*,
> Look too eagerly *beyond*."

0 to 60.

11 THEORY AND PRACTICE

1. Why should a teacher read regularly some educational publication? 10

2. Is it necessary that your daily programme should specify the time for study as well as recitation? 10.

3. How many terms and in what grades of school have you taught? 10.

4 Define Corporal Punishment. How many cases ought to occur in a school of 50 pupils in three months? 2 pts. 5 each.

5. Are boys or girls the easier to manage in school? Mention points of difference in their management. 2 pts. 5 each.

6. What is the teacher's duty during recess? 10.

7. Is the correct teaching of vocal music of any use further than the musical information imparted? 10.

8. What do you teach outside the course of study? 10.

9. Write of the relations between teacher and School Board 10.

10. Between teacher and parents. 10.

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12 GEOGRAPHY.

1. Give some account of the extent, resources and people of the countries engaged in the last European war. 10

2. Trace a water route from Bismark, Dakota, to the largest city of Continental Europe. 10.

3. Bound and describe Kentucky. 10.

4. How wide is the Torrid Zone, and what determins its width? 10.

5. Why does the sun shine on the north side of our houses in summer, morning and evening? 10

6. How wide are the Temperate Zones, and what determines their width? 10.

7. Where are the Great Antilles? Name them 2 pts. 5 each

8 Bound and describe the most powerful of the South American States. 10.

9, 10. Name the five first-rate powers of Europe in the order of importance. 6 off for each omission.

STATE EXAMINATIONS AND DIPLOMAS.

The following circular, sent to all parts of the State, in February last, fully explains the subject of State certificates in Colorado:

OFFICE OF SUPERINTENDENT OF PUBLIC INSTRUCTION.

DENVER, COLORADO, February 1, 1884.

The State Board of Education is authorized to grant diplomas to teachers eminent in their profession by reason of character, scholarship, and successful experience, by virtue of the following provisions of the School Law, viz.:

SEC 3. The State Board of Education is hereby authorized to grant State diplomas to such teachers as may be found to possess the requisite scholarship and culture, and who may also exhibit satisfactory evidence of an unexceptionable moral character, and whose eminent professional ability has been established by not less than two years' successful teaching in the public schools of this State Such diplomas shall supersede the necessity of any and all other examinations of persons holding the same, by county city or local examiners, and shall be valid in any county, city, town or district in the State, unless revoked by the State Board of Education

SEC 4 But State diplomas shall only be granted upon public examination, of which due notice shall be given, in such branches and upon such terms, and by such examiners, as the Superintendent of Public Instruction, the President of the State University, the President of the State Agricultural College and the President of the State School of Mines may prescribe.

The Committee of Examination, constituted by section four above quoted, after carefully considering the provisions of the statute, has decided that applicants for State diplomas should be required to comply with the following

TERMS AND CONDITIONS.

1 To furnish the State Superintendent, prior to examination, satisfactory evidence of good moral character

2. To furnish the State Superintendent satisfactory evidence of having taught, with decided success, not less than two years in this State.

3 To pass a very thorough examination in Reading Mental and Written Arithmetic, English Grammar, Modern Geography, Physical Geography, History of the United States, the Constitution of the United States and the Constitution of Colorado, with the Elements of Civil Government, and Theory and Art of Teaching, limited for 1881 to Payne's Lectures on Teaching, and an Essay on Horace Mann, specific topics for the essay to be given at at the time of writing.

4. To pass a satisfactory examination in Physics, Anatomy and Physiology, Botany, Zoology, Chemistry, Astronomy and Geology. The examination in these branches will embrace the rudimentary principles only. School Law of Colorado, Algebra, the Elements of Plane and Solid Geometry, not including Spherical Geometry. English Literature, to be limited to general questions upon American poets and a special examination upon Whittier's *Snow Bound.*

5. To pass a satisfactory examination in one branch of the following group, choice to be made by the candidate:

Latin to be limited to the first four books of Cæsar, the first two books of the Æneid of Virgil, questions upon grammatical principles involved in the passages translated, and Latin composition; German, to be limited to translations from German into English and from English into German, and Schiller's *William Tell,* with questions on German Grammar; Spanish, to be limited to Rudiments of Spanish Grammar, outlines of Spanish Literature; el si de las Ninas by Moratin; sight translation from Spanish into English, and from English into Spanish.

CREDENTIALS.

In regard to moral character, no set form of evidence is required, so that the fact of good character appears to the satisfaction of the Committee of Examination If an applicant is personally known to either member of the Committee as of good character, it will be sufficient to state the fact; no evidence will be requisite If not, written testimonials from one or more responsible persons acquainted with the applicant will be required *There must be no doubt on the question of character.*

In respect to the length of time that an applicant has taught, his own statement, giving the time place, and kind of school, will be sufficient.

Concerning success in teaching, written testimonials from employers, or other responsible and competent persons acquainted with the facts, will be required *The evidence upon this point is vital, and must be clear and explicit.*

The minimum time to be accepted for two years' teaching is fixed by the Committee at sixteen school months.

CONDITIONS PRECEDENT.

Satisfactory evidence relative to character, length of time taught, and success, must be furnished before a candidate can be admitted to the examination; it is a condition precedent, and should be transmitted to the State Superintendent, by each candidate, along with his application for examination, so that if defective due notice may be given, and that there may be no disappointment or loss of time in the inspection of credentials on the day of examination. Any one whose credentials are unsatisfactory will be promptly informed, and the deficiency pointed out, that it may be supplied, if practicable, and if not, he will be declared ineligible, and saved the expenses of attendance. Attention to these preliminaries is important; that there may be time for this, the application and credentials should be sent in by June 1. There will be no time to inspect testimonials during the examination, and none can be examined without them.

Papers forwarded as testimonials must, in all cases, be originals. If any applicant wishes the originals returned, copies thereof, for filing in this office, must be sent with the originals When copies are so sent the originals will be returned, but not otherwise.

The candidate must also state, when he sends in his credentials, in which branch, in the elective studies named above, he will offer himself for examination, such choice to be final.

MODE OF EXAMINATION.

The questions to be answered under each branch embraced in the written examination, will be printed on slips of paper and consecutively numbered. Each applicant will be furnished with one of these slips and with pen and paper. A definite time will be allowed to each branch. Each answer must bear the number of the corresponding question. In questions requiring demonstration or analysis, the entire work must be given, and not merely the result or answer, so that the several steps of the process may appear, and the examiners be better enabled to judge of the candidate's habits of thought and reasoning.

In addition to writing answers to the printed questions, candidates will be examined orally in Reading and Arithmetic, but, in the latter branch, the written examination will have double the weight of the oral in determining the standing.

MODE OF AWARD.

The greatest care will be taken to make the examination strictly impartial. To this end each candidate will be given a number, by which he will be known during the examination, and he will be required to write his name, age, nativity and post-office address on a slip of paper and place the same in the envelope furnished, and put his number, but not his name, on the back. Each sheet of paper containing answers must also contain the number of the candidate using it

In grading the papers, the examiners will note the grade of each one opposite the number found thereon The envelopes containing the names will not be opened until the papers have been examined and the results obtained. After all papers have been finally graded, the marks of the oral examinations will be combined with the marks of the written work.

Diplomas will be awarded only to such candidates as secure the unanimous recommendation of the Board of Examiners.

In determining the merits of the papers, the examiners will be guided by the following rules: Scale, 100. In Zoology, Physics, Chemistry, Astronomy, Geology, the minimum will be 60; in all other branches, 70 Certificates will be recommended when the candidate's average for the whole examination does not fall below 75: *Provided*, that in no branch he is below the minimum fixed for it The time for Chemistry, Astronomy, Botany, Zoology, Physics, Physiology, Geology, Physical Geography, and Geography will be one hour each In all the other branches, two hours will be allowed. In making up the average, each branch to which two hours were given in the examination will be counted double the branch to which but one hour was given. The candidate will be graded in spelling by noting the accuracy of the spelling in several pages of his papers written at this examination

If a candidate reaches the required average for examination, but falls below the minimum in one or more branches, he will be required to take those branches only at the next examination, and will be recommended for a diploma when he has passed in each with a grade of 75. Candidates who fail to reach the required average will be allowed credit for topics on which they rank 95 or more, and at the next examination will be excused in such topics.

TIME AND PLACE.

The examination will begin June 30, and continue four days, at Denver.

ANNOUNCEMENT OF RESULTS.

Some time must elapse after the close of the examination before the results can be announced. Such an inspection of the work submitted as will enable the examiners to do impartial justice requires time but as soon as the report of the examiners is received by the State Board, diplomas will be forwarded to those declared by the Board of Examiners to be worthy of them. Applicants who fail will be apprised of the fact by letter.

GENERAL REMARKS.

Punctual attendance upon all four of the days will be very important.

The rules governing the examination will be stated at the beginning of the examination, and general directions given, which will not be repeated. Moreover, there will be full work for the whole time, and persons arriving after some of the topics have been written upon cannot make up for lost time without protracting the examination, which will not be practicable to do; therefore, no person arriving two hours or more after the session has begun will be allowed to participate.

Inasmuch as a State diploma supersedes "the necessity of any and all other examinations of persons holding the same, by county, city or local examiners," and is valid for life, unless revoked for cause, it is, therefore, not only the highest known to our system of public education, and an honor to those receiving it, but it has also an important business value to all professional teachers It is the object of the law, in providing for these examinations specially to recognize and honor those experienced and successful teachers who have given character and dignity to the profession in this State, and to furnish to young teachers a stimulus to honorable exertion.

By order of the Committee,

JOS. C SHATTUCK,
Superintendent of Public Instruction.

It only remains to be said that, no applications being filed within the specified time, there was no examination.

SUPPLY AND DEMAND.

To the question which comes to this office by nearly every mail, "Is there a demand for teachers in Colorado?" I know of no better answer than that of Philip to Nathaniel, "Come and see." Our population is shifting but steadily growing; teachers leave the school room for other work here as elsewhere—perhaps rather more than in the older States; not a large number of our young people, as yet, engage in teaching. These causes make room for some new arrivals every year, but it is rare that a teacher is engaged by correspondence. The employment of teachers is the business of the local school Boards, and many Boards make it a rule to make no engagements by correspondence. Hence it is safe to say to all applicants by letter, "The only way to get a situation as teacher in

Colorado, is to come and find a vacancy and secure employment by personal application." Schools begin early in September, and engagements for the year are usually made *one or two months previous*. For length of school terms and wages paid, see tables elsewhere.

COURSE OF STUDY.

A little more than two years ago a convention of gentlemen interested in school work, and representing various parts of the State, met at the office of the State Superintendent, and, after deliberation, appointed committees to prepare courses of study for both ungraded and graded schools, including high schools. These committees prepared such courses, which were published in the last bienniel report from this office, and also upon the inside of the cover to the daily registers furnished by the State. At the session of the State Teachers' Association in December, 1883, a committee was appointed to revise the high school course and report the revision to the Superintendent of Public Instruction. This committee consisted of Mr. J. H. Baker, of Denver, Mr. W. C. Thomas, of Leadville, and Mr. Oscar Jackson, of Pueblo. The course of study recommended by this committee is found below, and is commended to all interested in high schools as worthy of adoption:

A GENERAL COURSE OF STUDY FOR HIGH SCHOOLS,

ARRANGED FOR FOUR YEARS OR THREE YEARS.

MATHEMATICS.	SCIENCE.	HISTORY AND ENGLISH.		FOREIGN LANGUAGE.
Algebra. Plain Geometry. Arithmetic and Book-Keeping. Solid Gometry. *Plane Trigonometry. *Review of Algebra and *Plane Geometry.	Zoology or Physical Geography. Physiology. Elementary Botany Physics. Chemistry. *Geology. *Astronomy. *Advanced Botany.	First Year.	Greek History. Study of Selections; Brief History of American Literature.	Latin or German throughout the Course.
		Second Year.	Roman History. Rhetoric; Study of Selections; History of Periods of English Literature.	
		Third Year.	English History. U. S. Constitution; Political Economy. Study of Selections; History of English Language.	
		Fourth Year.	*Periods of History. *Study of Selections; Psychology.	

*These studies may be omitted in a three years' course.

By "English" is meant both the Literature and the Language.

If these four lines of work are pursued at the same time, it is not expected that five recitations per week will be given to each

The Committee recommend Drawing as an addition to the course.

This Course, as it stands, will give thorough preparation for Scientific Courses in the best colleges. It may be modified by substituting French for History and English the third year, and Science the fourth year.

If desired in case of any pupil, French may be substituted for Mathematics the last two years.

A CLASSICAL COURSE OF STUDY FOR HIGH SCHOOLS.

ARRANGED FOR FOUR YEARS OR THREE YEARS.

MATHEMATICS	SCIENCE	HISTORY AND ENGLISH	FOREIGN LANGUAGE.
Algebra. Plane Geometry. *Review of Algebra and *Plane Geometry.	*Zoology or *Physical Geography. *Elementary Botany. Physics.	First Year. { Greek History. Study of Selections; Brief History of American Literature Second Year { Roman History. Rhetoric; Study of Selections. History of Periods of English Literature. *Review of Greek and Roman History	Latin four years Greek two years. *French optional, last two years.

*These studies may be omitted in a three years' course.

In preparation for Harvard, certain subjects are elective. Harvard and Yale require either French or German for admission.

It will be seen that this course corresponds as far as practicable with the General Course.

This Classical Course and the Scientific Department of the General Course correspond in essential points with the requirements for the University of Colorado.

NORMAL INSTITUTES.

To Larimer County belongs the credit of holding the only real *working* Teachers' Institute that has been held in the State. Under the direction of County Superintendent McCreery, a goodly number of the teachers of Larimer County were brought together for a two weeks' term, the third and fourth weeks of August, 1883, and the same in 1884. The time was spent in work in the common branches, to the end that better methods of illustrating and teaching these branches might be acquired. The teachers of this county keep up a county association, by means of which they have adopted a course of reading—partly professional and partly general—which many of them are pursuing, and to a discussion of which some time is given at the meetings of the association. It is an echo of Chautauqua, sent back from the foot-hills of the Rockies, worthy of all praise.

There has been considerable discussion, during the last three or four years, concerning the propriety of establishing a State Normal School at some point, as a separate institution. There is a Normal Department at the State University, which affords ample facilities to meet all demands, as yet, as far as numbers is concerned, but it is urged that our State is so large in territory that no one institution can well accommodate the entire State, because the distance will be so great from many points. A little thought, however, must convince any one that our population is yet too sparse to support a separate Normal School at any point, or to justify the expense. If a small fraction of what a Normal School will cost were appropriated to assist the counties in the support of Normal Institutes of two to four weeks each year, at least in all the larger counties, there can be no question but that the schools would be benefitted far more than by the establishment of another State institution of learning of any description.

The Normal Institute is not an experiment. Its usefulness has been thoroughly demonstrated, and its necessity recognized in all of the most enterprising and prosperous Western States. The influx of well-trained teachers from abroad has enabled us to bring up the schools of this new

State to a high degree of excellence, but the time has fully come when the need of the Normal Institute is felt. The graduates of our own schools are entering the ranks of teachers. Not all those who come to us from abroad, and who secure employment, are beyond the need of additional training, as Superintendent Packard, of Weld County, shows in his remarks on a previous page. County Normal Institutes, if once established on a sound basis, would soon create a public sentiment in favor of selecting teachers from among those who attend the Institutes, and do much to remedy the evil of which the Superintendent of Weld complains, and which is by no means peculiar to his county, Another point worthy of serious consideration is, whether any more financial burdens ought to be laid upon the taxpayers of the State. The credit of the State is now of the best, and it is much easier to keep it so than to restore it when once impaired. As far as I have been able to learn, there is no demand, whatever, for another State educational institution, except by the communities which expect help by the spending of public money in their midst. Until there is some sounder reason than this, the Legislature should be deaf to all appeals for the establishment of a State Normal School, more especially when the expenditure of $2,000 to $3,000 per annum, distributed where it will do the most good among the counties, for the support of county Normal Institutes, will fill a real want, and be of marked benefit to the schools of the State.

SMALL DISTRICTS.

Colorado schools, in districts of small population, suffer the ills incident to small, ungraded schools, with scant revenue, everywhere. If there be any way whereby a country district, with few people and a small amount of property from which to derive its revenue, can afford its handful of children as good educational advantages as its populous and wealthy neighbor, that way has not yet been found. I know both by the experience of my childhood and by recent observation, that this difficulty is no less serious among the New England hills than with the scattered ranches of Colorado. Occasionally there is found in charge of one of these small country schools, one whose soul has been touched with the Divine fire, without which any teacher is but a drudge, and with which, not infrequently, a man or woman in charge of a small country school, for a few weeks, has kindled the entire neighborhood, roused a noble enthusiasm for real learning in the heart of every boy and girl in the community, in short, stamped her better self on the lives of her pupils, as no teacher in a large city school ever did or ever can. We lament the short schools, inexperienced and often incompetent teachers of the country districts, but the fact is open to all that the business of this country is, and always has been, largely in the hands of men whose boyhood gathered its strength amid just such untoward surroundings. Generally a *real teacher* costs money, and it is the prevailing vice in the management of the district schools that some one is hired to "keep the school," because he or she will work for small pay, and thus a longer term is secured. If people will only believe, and have the courage to act up to their convictions, that three months under the instruction of an apt teacher, is better for a child than nine months under an unskillful one; that whether the school house be good or poor, the one thing that determines the character of the school is the *teacher*, and that skill in any sphere of human activity, costs money, then the rural districts need not deplore their lack of educational facilities, as an evil without compensation. County Superintendents should exercise great care in ordering the division of districts, or cutting off a portion of one and annexing it to another on petition. Too often these divisions are desired for no better reason than a neighborhood quarrel. The Superintendent should only act after such careful investigation as will put him in possession of all the facts, and he is convinced that the proposed change will be beneficial to a majority of those concerned.

SCHOOL BUILDINGS.

Probably in no other way is so much money misspent with the best of intentions, as in building school houses.

I will not discuss exteriors, because here arise questions of taste and length of purse, but there are certain matters of interior arrangement upon which depend the comfort and health of the children in school, to which I invite careful attention. As an introduction I wish to call attention to the cuts in this report.

PLATE ONE

Is Franklin School, West Denver. This is the most expensive school building yet erected in this State, costing $59,500 Its seating capacity—single seats—is 660. It is heated and ventilated by the Ruttan system, and by an improved arrangement the air can be tempered in the supply pipes to any degree from hot to cold, thus introducing cool air, when the rooms are too warm, *through the registers*; a very excellent substitute for the usual method of admitting the cold outer air directly by door or window.

PLATE TWO

Shows the floor plans of the same building. The rooms are all airy, well lighted, and cheerful, the seats so placed that the light comes to all pupils from the back and left side. The windows are all furnished with transoms opening in at the top, to which special attention is called further on. There is a director's room with fire-proof vault in the basement. Altogether the building is very attractive and admirable in all its appointments.

PLATE THREE

Represents the floor plans of the Emerson School, Denver, the last building completed in the city. It cost $27,600, and seats 440 pupils in single seats. It has a steep shingle roof and enough of the "Old English" in exterior appearance to be substantial without being "dudish" In this building the light is admitted only left of the pupils. The windows being large, the light is ample for our sunny climate, but would doubtless be insufficient in the states east of us. Attention is called to the spacious halls and broad stairways, both in this and the Franklin This we claim as an excellent feature of all our recent Colorado large buildings not often found elsewhere. These buildings can be emptied of 400 to 600 children in about two minutes. The halls being warmed, the practice is of late to have the doors between it and the school rooms open at all times, except during singing. This gives the children the benefit of all the air space inside the building, and its effect is excellent. The building is heated by hot air furnaces, and ventilated very effectively, and the windows are all furnished with transoms. No light being admitted behind the pupils it is far less trying to the eyes of the teachers than the usual arrangement which obliges them to face the glare most of the time. Like the Franklin, the Emerson is so nearly perfect throughout as to leave little to be desired.

PLATE FOUR

Is given as a desirable plan for a one-room country school house, which will accommodate sixty-four pupils If seated with double seats, the width may be 24 feet instead of 32, although the latter width gives none too much air space for that number of pupils. If the width be reduced to 24 feet, it may be desirable to put the vestibule on one side—say where A now is,—and have one wardrobe instead of two. The position of the stove is a matter of choice. By taking out the back seat on each of the two rows beside the middle aisle, the stove may be placed there. If the house be of brick, the chimney may be built in the middle of the rear wall—flush on the inside.

School Boards will find the following table correct and valuable. It will aid them in determining just how many seats a house will hold, and the sizes wanted.

Wainscot the school room all around 2 feet 6 inches high, above the floor and Teachers' Platform. Make a smooth wall above that, and put Liquid Slating on the wall, 4 feet wide, above the wainscoting. Recitation Seats or Cases for District Library and Apparatus can be put where convenient. Windows should extend to the ceiling to throw the light over the room.

Single Seats and Desks for One Pupil.						Double Seats and Desks for Two Pupils					
Size.	Seat inches high	Seat inches wide	Desk top in wide	Desk inches long	In. from Desk to Desk	Size.	Seat inches high.	Seat inches wide	Desk top in. wide	Desk inches long.	In from Desk to Desk
A	17	14	16	24	34	A	17	14	16	42	34
B	16	14	15	24	32	B	16	14	15	42	32
C	15	13	14	22	30	C	15	13	14	40	30
D	14	13	13	22	28	D	14	13	13	40	28
E	13	12	12	18	26	E	13	12	12	36	26
F	11	12	11	18	24	F	11	12	11	36	24

VENTILATION AND SANITATION—PLATE FIVE

Is an inside view of a window with transom at the top, which arrangement has proved to be one of the very best for supplying fresh air to the school room directly from the outside without subjecting pupils near the windows to a dangerous draft. If one or more of these be open on different sides of the room when there is any wind at all, the air will come in freely, but is forced to take such an upward direction that it does not fall upon the heads of any, as is always the case when the ordinary sash is lowered at the top. Its superiority to the common window has been demonstrated by use in many school houses in Denver and other towns, and so excellent are its results that one of the most experienced city superintendents in the State declares that it should be made unlawful for any board to build a school house in this State without putting such transoms over the windows, and I fully endorse his emphatic approval. It is especially valuable in Colorado where so many days of our school year are clear and admit of open windows on the sunny side of the building, even in cold weather. I urge upon school boards the use of this transom, the real merits of which are almost sure to be undervalued by those who have not proved it. *It is all I claim for it, and more*, and its cost is trifling. For large and heavy transoms it will be necessary to put a transom lift, shown on the right of the cut, on both sides.

Referring again to the diagram of school room—Plate 4—we find that a room 32x32 and 12 feet high will contain 12,288 cubic feet of air. The amount of fresh air allowed to hospital patients is about 2,500 cubic feet per hour. If we allow two-fifths this quantity to our children in school, they will require 1,000 cubic feet per hour, and sixty children will need an hourly supply of 60,000 cubic feet, or nearly five times the amount contained in the room represented by the diagram. In other words, the air of this room must be entirely changed every 12 minutes, if the children are to breathe pure air. How many school rooms fill these requirements? Is is not rare to find one, even among costly city school buildings, that make more than one-half these allowances either in air space or rapidity of change?

The best authorities estimate the allowance of floor space from 15 to 18 square feet to each pupil, and 250 to 300 cubic feet of air space as the *minimum* consistant with health, and this is less than one-eighth the hospital allowance as given above. If the room be 32x32, each of 64 pupils will have 16 square feet of floor space, and 14 feet in height will give each 224 cubic feet of air space; 12 feet in height will give each 192 cubic feet. Reduce the size to 32x24, and there will be but 12 square feet of floor space, and if 12 feet high 144 cubic feet of air space, if 14 feet high 168 cubic feet to each pupil.

Park's Practical Hygiene states: "If 100 cubic feet of air be allowed to a man in a sealed room for one hour, 3,900 cubic feet of fresh air is required to restore that 100 cubic feet to a health standard."

Dr. Albert Buck of New York, a recognized authority on hygiene, says: "We expire 14 to 20 cubic feet of air per hour, requiring 200 times that amount of fresh air to dilate it to a health basis, or 3,500 cubic feet per hour."

In the Report of New York State Board of Health, 1882, Dr. D. F. Lincoln says of school requirements: "Assuming 1,800 cubic feet of air for each pupil per hour, and starting with 300 cubic feet for each pupil, six changes of air per hour are necessary in order to attain reasonable health standard."

Let anyone compare the first half dozen school rooms within his reach with the above figures, and the statements of these eminent authorities, and he will quickly see how the "Murder of the Innocents" is going on daily in about nine-tenths of the school rooms in this enlightened land.

Rooms are seated with double seats for the sake of economy in space, because room costs money, and no thought is given to what the occupants shall breathe. It should not be necessary at this late day to quote the well worn proofs that air loaded with organic contamination is the source of nervous disorders and depression of the physical powers, of tubercular diseases and consumption; everyone knows them by heart. It is not, however, as generally known that children are many times more sensitive to atmospheric poison than adults, and that their natural brightness and activity during their school life, instead of showing that they endure its noxious influences with impunity, only conceal for a time the disorganization of lungs, or nervous system, which will assert itself when it is too late to remedy it. In planning our large city school houses, some attention is usually paid to ventilation. Too often, however, the result is a costly abortion, as the nostrils of every visitor inform him before he is fairly inside the outer door, and in very few of our country school houses, east, west, north and south, is there any evidence of an intelligent comprehension of the end to be attained, or the adaptation of means to that end. Not only are they wholly destitute of any provision for air, but, being warmed by stoves, no fresh air is admitted. Yet small school houses are perhaps the easiest of all buildings to ventilate if the object to be secured and the dangers to be avoided are kept in mind.

Briefly, the aim of ventilation should be to maintain a steady supply of fresh air, and withdrawal of foul, at all parts of the room, removing the products of respiration and organic particles as fast as thrown off, and leaving no corners stagnant or unswept by the purifying current. To accomplish this in small buildings, the windows should be so made as to be easily handled. Nothing can take the place of aeration by means of open windows. *If the transom be used*, the air will change so frequently that it will not become seriously vitiated. Artificial ventilation, though required for changing the air when the windows are necessarily closed, is almost always insufficient, unless the room is from time to time thoroughly refreshed and purified by the sweep of the free air through all its windows widely opened. Such an atmospheric washing should be secured at recess, and at the close of each session, banishing teachers and children from the room meanwhile, if necessary. Nothing but the most inclement weather should prevent this cleansing. Eyes should be fixed in the upper sashes, and a pole and hook furnished with which to handle them; the window frames must be well made and looked after from time to time to see that all is in working order. It is a shame to any district to allow a window of its school room to remain in such a condition that the teacher cannot easily move it at will.

There are times, however, when windows cannot be opened, and means must be provided for insuring the withdrawal of the respired air from the room in some other way. If fresh air is to be introduced into a room, provision must be made for the escape of foul air. The simple experiment of attempting to blow into the mouth of a bottle will impress this fact upon the mind, and will show why it is that rooms supplied with hot air from furnaces cannot be warmed until a window or other outlet is opened, allowing the pent-up air to escape, and a fresh supply to enter in its place.

For our country school houses, and for two to four room buildings in our villages, it is useless to consider any costly system either of heating or ventilation.

The powers and properties of air shafts are often so grossly misunderstood that an explanation of their action may be necessary before proceeding to details. Nothing is more common or more absurd than to see rough ventilating flues, 4 by 8 inches, built in walls without any provision for heating them, under the supposition that they will "draw." The action of every such shaft or chimney is precisely analogous to the movement of two boys balanced on a see-saw. If their weight be equal, neither moves; if one is slightly heavier, he descends and the other ascends. So with ventilating shafts; the column of air in them is balanced against a column of the same size and height outside of them. If the outer air is cold and that in the shaft warm, the latter column will be slightly lighter, because, being expanded, a given volume contains less weight. This difference of weight, if there is not too much friction in the chimney to be overcome, will incline the balance, and the air in the chimney will rise, cold air from without descending to take its place. The actual difference of weight between the column of air in a chimney 12 inches square and 30 feet high, at a temperature of 100 degrees Fahr., and an equivalent volume at 32 degrees Fahr., would be five ounces; and this, deducting the friction of both the ascending and descending currents, will be the measure of the ascensive force of the air in the shaft. This feeble force is all we have to depend upon, and it hardly need be said that all obstructions to its action must be avoided. The foul air shaft must be large, straight and smooth. One shaft two feet in diameter will carry off about as much air as six shafts each one foot in diameter, because of the increased friction in the smaller shafts. The one indispensable condition is, this shaft must be heated, else it will be useless. It has also been demonstrated under my own observation, that the best results are obtained *when the greatest heat is applied in the upper portion.* I have in mind a costly and beautiful church, supplied with foul air shafts, warmed by steam coils at the bottom, and though the shafts are of sufficient capacity and well located, they do not give satisfaction at all, it often being found necessary to close them when they are most needed, to prevent the in-flow of cold air. If the upper third of the shaft is heated there is always an upward movement of the air within it. Referring again to Plate 4, E is the chimney, built upon the ground always,—and for this room it should be not less than 16x16 inches—inside. Into this the stove pipe should be inserted 2 or 3 feet below the ceiling. The pipe or flue for the smoke, made of galvanized iron, or something heavier, should be put into the chimney when it is built, and carried to the top of the chimney. Just above the floor, in this case, above the floor of the platform, an opening must be made into the chimney, nearly equal in size to the sectional area of the chimney. Whenever there is fire in the stove, the column of air in the chimney is heated by the smoke pipe from the point where it enters to the top, and a "draft" is created, which takes out the cold air near the floor, which can always be best spared

Another method is to build two flues side by side, using one for smoke and the other for foul air. The results from this are not so satisfactory as when the smoke flue of metal is carried up inside the air shaft, because the latter gives a higher temperature to the air in the shaft.

The withdrawal of the foul air is always a more difficult problem than the introduction of fresh, yet the latter must receive attention. For a large room, or for a two or four room building, a furnace in the basement, with its smoke flue carried up inside a large ventilating chimney with which all the rooms are connected, is always to be recommended. If for any reason a furnace is not used, still fresh air, suitably warmed, can be introduced. There are now ventilating stoves made, which are really excellent. One made by Richardson & Boynton is in use in several school rooms in the state, and is well liked. Fresh air is admitted under the stove and carried up between the fire-box and the outer jacket, and, after becoming heated in the passage, is discharged at the top of the stove. If the ground is dry under the floor, and there are grated openings in the foundation, as there always should be, a hole in the floor under the stove is all that is needed. In the second story a pipe can be run between the joists from a suitable opening in the wall.

John Grossius, of Cincinnati, also makes a similar stove, which gives satisfactory results, and no doubt there are others. I was informed recently by Supt. Peasley, of Cincinnati, that after some years of trial, the steam-heating apparatus has been removed from all the public school buildings in that city, and the Grossius stove put in.

If these stoves are too costly for the district purse, excellent results may be obtained by putting a jacket of galvanized iron around a common stove, about six inches from the stove, resting on the floor, and extending to the top of the stove, open at the top, strengthened by large wire, with large door in front to admit of feeding and cleaning the stove. The fresh air being admitted under the stove, is heated by passing up between the stove and the jacket, and is discharged warm into the room. With the ventilating flue already described, this simple contrivance, within reach of the poorest district, will keep the air of the school room in fair, if not perfect, condition. There will be the additional advantage that the pupils who are obliged to sit near the stove will not be roasted for the benefit of those more distant. These appliances are as suitable for churches and halls as for school houses.

I have discussed ventilation and heating somewhat at length, because six years of visiting school rooms in Colorado and elsewhere, has convinced me that the most serious defect in the construction of modern buildings, public and private, is the absence of any provision for ventilation, or the use of methods entirely inadequate and often absurd; that the seeds of disease are sown in our school rooms, too often in greater abundance than the germs of intellectual development; while, except in large buildings containing many rooms, ventilation is not difficult, and ought not to be rare. In closing, I again call attention to the ventilation chimney I have described, and the window transom shown by plate 5.

For many valuable suggestions on the subjects of heating and ventilation, I am indebted to Circular No. 4, 1880, issued by the Bureau of Education at Washington; but I have recommended nothing which I have not proved by personal observation.

The following are a few out of an almost exhaustive series of questions officially issued to teachers in the Ontario schools by the Provincial Board of Health. They have equal pertinence for every school in the United States and Colorado:

1. How many cubic feet of air space for each pupil?

2. Is light admitted in front of the pupils, at their left or right side, or from behind them? or is it admitted from two sides?

3. Is light well distributed?

4. How near to the ceiling and to the floor do the windows extend?

5. Are there any blinds on the windows?

6. Is a uniform and equable temperature of from 63 deg. to 70 deg. F. constantly maintained during school hours? Is this tested?

7. Is the air dry? What means are adopted for supplying moisture?

8. Explain fully how each room is ventilated in cold and in warm weather (whether by windows open at the top or bottom, by ventilating flues, or in what other way.)

9. To what expedients do you resort to prevent draughts from open windows striking pupils?

10. Is the air of the school-room completely changed by opening doors and windows at stated intervals during school-hours and at recess?

11. How often is the school-room swept per week?

12. Do pupils frequently complain of headache, cold feet, or any symptoms indicating the existence of defects in ventilation or heating?

13. What is the duration of school-hours and recesses?

14. How are scholars and teachers occupied during recess?

15. At what periods are the greatest numbers absent?

16. Is the water pure, cold and abundant?

17. If from a well, what means have been adopted to prevent its receiving the soakage from surrounding grounds?

18. Is drinking-water kept in the school-house? If so, where is it kept, and how is it protected from dust and other impurities?

19. Are there cellars or other excavations beneath the school-house?

20. Are there water closets for the different sexes in separate buildings?

21. Are they properly protected from observation and from inclemencies of weather?

22. State where they are located in relation to schoolhouse, wells, etc., and give distances.

23. What means are adopted to keep them clean?

24. Are the receptacle and the closet itself well ventilated?

25. Is any disinfectant used, and what?

26. If water-closets are used, are the traps and appliances efficient?

27. In the case of privy-pits, how are the vaults constructed, how often emptied, and by what means?

28. Have you any observations to make regarding the clothing of pupils? Protection against sitting in wet feet, etc.?

29. Is there any instruction given in Hygiene?

TEXT BOOKS

Section 16, Article IX., of our State Constitution reads as follows: "Neither the General Assembly nor the State Board of Education shall have power to prescribe text books to be used in the public schools."

The statute makes it the specific duty of each school board to determine what text books shall be used in the schools of the district, with the limitation that after the adoption of any book, it cannot be changed under four years. To make the adoption binding, the board must take formal action at a meeting at which at least a majority are present; the action must be properly recorded in the minutes of the board, *and the books put into actual use.* The courts of this State have never passed on the question, but courts in other states have put this construction upon the word "adoption" in similar statutes.

This section of our Constitution has saved the State from the unseemly contests for "State adoption" to which many other States are subjected, and from any attempt by scheming printers to secure text books prepared and published by the State. For the protection thus afforded, let us be thankful.

The sentiment in favor of "free text books"—that is, text books owned by the district and loaned to the pupils —seems to be growing in many places in the country. The plan has given such satisfaction in various districts elsewhere, that perhaps the time has come for the slight change needed in our law to allow school boards to own and furnish the books where the public sentiment of the district approves the experiment.

COMPARATIVE TABLE.

SUMMARY

DESCRIPTION.	1883	1884	Increase.
Number of districts	552	604	52
Number of males of school age	26869	28433	1564
Number of females of school age	26557	27809	1252
Total school population	53426	56242	2816
School population between 6 and 16	41770	43131	1361
School population between 16 and 21	11656	13111	1455
Number between 6 and 16 enrolled in school	33030	34730	1700
Number between 16 and 21 enrolled in school	3414	3142	— 272
Number enrolled in graded schools	20930	22131	1201
Number enrolled in ungraded schools	15514	15741	227
Total number enrolled in school during the year	36444	37872	1428
Average daily attendance	23008	23397	239
Per cent of school population enrolled in school	68	70	2
Per cent. of school population under 16 enrolled in school	79	83	4
Per cent. of school population over 16 enrolled in school	29	28	dec. 1
Per cent. of average attendance on enrollment	43	62	19
Per cent. in graded schools	57	58	1
Volumes in school library	6096	6387	291
Number of school houses	459	525	66
Value of school houses and property	$1,551,080	$1,676,130	$125,050
Number of male teachers in graded schools	51	66	15
Number of female teachers in graded schools	295	317	52
Number of male teachers in ungraded schools	233	262	29
Number of female teachers in ungraded schools	454	448	dec 6
Average monthly wages of male teachers in graded schools	$109 89	$110 15	26
Average monthly wages of female teachers in graded schools	68.45	66.41	dec 2.04
Average monthly wages of male teachers in ungraded schools	51 23	51.30	.07
Average monthly wages of female teachers in ungraded schools	50 91	41 35	dec 9 56
Average cost per month for each pupil based on enrollment	. . .	2 58	
Average cost per month for each pupil based on average daily attendance		4.19	
Received from county tax (general fund)	$329,408	336,903	7,495
Received from district tax (special fund)	269 442	219,784	dec 19,658
Received from district tax for building fund	37,829	189,996	152,167
Received from all sources, including amount on hand at beginning of year	992,119	1087,659	95,540
Expended for teachers' wages	367,356	432,255	64,899
Expended for current expenses	117,194	140 322	23,128
Expended for buildings, sites and furnture	267,611	237,321	dec. 30 290
Total expenditure	1,744,280	809,898	dec 931,382
*Expenditure per capita of school population	9 52	10 51	99
Expenditure per capita of enrollment	14.00	15 63	1 63
Expenditure per capita of average attendance.	22 12	25 33	8,21
Expenditure per capita of population between 6 and 16	14.41	13 71	dec. 1.30

*In calculating these expenditures, only interest on amount expended for buildings, sites, etc., is added to the other amounts expended

GENERAL STATISTICS.

The school population of Colorado since its admission was as follows:

1877	21,612
1878	26,473
1879	29,738
1880	35,566
1881	40,804
1882	49,208
1883	53,426
1884	56,242

The number of different pupils enrolled in school:

1877	14,085
1878	16,641
1879	18,771
1880	22,119
1881	26,000
1882	31,738
1883	36,444
1884	37,872

The average daily attendance:

1877	8,141
1878	9,699
1879	10,919
1880	12,618
1881	14,649
1882	18,488
1883	23,008
1884	23,307

The number of school houses:

1877	219
1878	249
1879	255
1880	292
1881	314
1882	370
1883	459
1884	525

Value of school buildings, sites and furniture

1877	$ 472,983
1878	474,771
1879	496,891
1880	682,410
1881	977,213
1882	1,235,491
1883	1,551,080
1884	1,676,130

Number of male teachers employed;

1877	233
1878	226
1879	255
1880	247
1881	245
1882	657
1883	284
1884	328

Number of female teachers employed:

1877	297
1878	341
1879	338
1880	431
1881	556
1882	630
1883	749
1884	795

What is known as the "General Fund" is derived from the county tax for school purposes, penal fines, and the amount received from the State fund.

The receipts from these sources have been as follows:

1877	$ 120,057
1878	128,788
1879	119,419
1880	182,326
1881	208,845
1882	254,804
1883	329,408
1884	336,903

Receipts from special (district) taxes:

1877	$ 65,394
1878	57,377
1879	95,675
1880	154,007
1881	168,927
1882	181,708
1883	269,442
*1884	409,780

*This includes tax for building fund not heretofore included.

Expended for teachers' wages:

1877	$ 140,780
1878	153,089
1879	153,144
1880	186,426
1881	240,384
1882	300,128
1883	367,356
1884	432,255

Total expenditure for school purposes, including buildings, sites, and furniture:

1877	$215,225
1878	243,850
1879	264,371
1880	395,227
1881	557,151
1882	661,419
1883	752,161
1884	876,671

*Expenditure per capita of school population:

1877	$7 95
1878	9 21
1879	8 88
1880	11 07
1881	13 64
1882	8 45
1883	9 52
1884	10 51

*In calculating these per capita expenditures, only interest on amount expended for sites and all permanent improvements is added to the other expenditures. It would be more nearly correct, as I think, to add the interest on a fair valuation of all school property, instead of on the amount expended for this purpose during the current year; but I follow the plan of the Bureau of Education at Washington.

Expenditure per capita of pupils enrolled in school:

1877	$12 20
1878	14 65
1879	14 08
1880	17 80
1881	12 90
1882	13 10
1883	14 00
1884	15 63

Expenditure per capita of average daily attendance:

1877	$21 10
1878	25 14
1879	24 21
1880	31 38
1881	22 88
1882	22 55
1883	22 12
1884	25 33

STATE FUND.

The amount of the Public School Fund, on Nov. 30, 1884, was $114,220. This is kept invested in State warrants at 6 per cent. interest. This interest, and the rental from leased lands, is distributed semi-annually to the counties that have made a legal report for the preceding year, per capita of school population, deducting from the portion of each county the value of the blank book and registers furnished. The first apportionment was made in 1879, and the annual apportionments have been as follows:

1879	$ 7,041 30
1880	15,683 76
1881	14,443 27
1882	17,953 76
1883	29,529 80
1884	32,038 42
Total	$116,690 31

The per capita has been as follows:

1879	26 cents, 6 mills
1880	53 "
1881	41 "
1882	44 "
1883	60 "
1884	61 "

Looking at the per capita expenditures on a previous page, one can see how small the help that comes from the State Fund. Our expenditures are almost $100,000 per month for the months in which the schools are in session, hence the entire proceeds of the State Fund for the six years inclusive, since it has been productive, would support our schools about five weeks. This is a poor showing for an endowment fund, but it is not at all certain that it is a calamity. The people of Colorado expect no schools except as they tax themselves to pay for them, and the prompt liberality with which they vote taxes—and pay them—for public schools, is worthy of emulation. It is of itself an endowment beside which the most colossal fund were poor. If the people of all the States were possessed of the same spirit, there would be little need of "National Aid to Education." It is not that our people are rich, but because they are determined to have schools, and knowing they need hope for no external aid, have learned to depend upon themselves.

WHAT LACK WE YET?

In nothing fashioned by human hands or human minds is perfection found. The machine of to-day is old iron to-morrow, because some more skilful hand has more cunningly adapted materials to the end in view; and a "body of sound doctrine" for one generation is laid aside like an out-grown garment by the next.

Many years since, at Edinburgh, the jewels in the crown of Scotland were locked up in a strong box, and that box put into another box, and so on, until they were supposed to be burglar proof. They were then locked up in the vault of the castle, there to remain for one hundred years;

the keys being then placed in a mortar and fired into the sea. Scarcely fifty years passed by, and the modern lock-picker opens the vault and the boxes without trouble.

No reasonable friend of the public schools will claim for them immunity from human defects. The schools of a community are, to an extent, exhibition galleries, from an examination of which one can judge with reasonable accuracy of the community, the grade of its refinement, and the tone of its morals.

As the morals and the culture of every community have some blemishes and some crudities, so there must be some improvement possible to its schools. While believing enthusiastically in the American public school, both for its results to-day, and its promise for to-morrow, I am not satisfied with its present achievements, any more than I am with any other institution of society. Progress is possible only to those who are dissatisfied with the present. This is put in telling phrase in a recent article in one of our local papers: "For be sure of this, that never anything worth preserving by posterity grew out of a satisfied man or a satisfied society. The glorious fruits of human progress sprang not from roots like these. All the grand characters of the past, the noble ones of earth, the benefit of their kind, whose ideas left their imprint on the ages in which they lived, and whose deeds live after them in the institutions we enjoy; were animated in life by a profound and lasting discontent, only satisfied at last in peaceful death" This is what Emerson called "the Devine unrest." It was the thought of the great Apostle when he wrote to the Philipians, "forgetting the things which are behind, and reaching forth unto those that are before." I am not a prophet of smooth things. It is the vice of professional associations that they are in fact mutual admiration societies, whose contented minds are only ruffled by adverse criticism from an outsider, when they bristle "like the quills of a fretful porcupine" I trust our State Association may not fall into this slough; but, "with malice toward none, with charity for all," there will be in all meetings of instructors and school officers, whether State or county or city, a free discussion of existing errors, and a "reaching forth to those things which are before." Stanley Hall says: "To believe that there is but *one true* method of instruction is erroneous. To persuade a young teacher that she has that method, is fatal." There is nothing so wholesome as sound criticism, and even captious, unfair criticism may be of great advantage. It is generally, not always, the exaggeration of a real defect, and it will always profit the critisised to separate the grain of wheat from the peck of chaff, and use the wheat. I confess it seems to me that not infrequently the critics of our schools have amassed a remarkably large stock of ignorance upon the topic of which they write.

I could wish that critics would not so frequently compare the average child with the perfect child, which exists only in imagination, and for every point where the real falls below the ideal, cry aloud against the school as the cause of the discrepancy, forgetting that when the perfect child puts in an appearance, there will be a perfect home from which he comes, a perfect church, and a perfect society, each and all of which must exist and play well their parts with the perfect school in fashioning the perfect child. It is so much easier to transfer than to bear responsibility; that the over-burdened common school is made the scapegoat to carry away into the wilderness the sins of the people. To those whose lances are so free in thrusting the school, I say, look about you a little to learn if there be not some lack in the other institutions which are responsible for the child, which should not be overlooked in fixing the blame for ills which we all admit. Above all, let it not be forgotten that it is the ordination of Providence that home should form our character. When the home is so arranged and conducted that children wander from the parental roof for amusement, it is quite unnecessary to seek further for the root of the evil life which is so apt to follow. The child or youth who does not love his home, or has none to love, begins the battle of life with tremendous odds against him. A few years since it was ascertained that 75 per cent of the convicts in Pennsylvania prisons were orphaned children, yet because more than 75 per cent. of them could read, a critic was ready to aim an arrow, pointed with this fact, at the public schools. No doubt better schools might have saved some, but I submit it should not bear all the burden; but if this unfair aspersion brought home to any teacher a keener realization of the weighty responsibility under which she works; if it aroused any community to the duty of looking after and caring for the waifs upon its streets, deprived of both home and school and becoming criminals by natural selection, then, indeed, even its unfairness is justified.

I could wish that the elegant gentlemen who so coolly mark out for the "children of the laboring classes," as they are pleased to term them, the limit of school instruction, beyond which it will be injurious for them to go, would wake up to the fact that all talk of "classes" of society, or a boundary to learning, beyond which any child may not go, because he is to remain in the condition of his parents, is the idlest of idle talk in this land of ours. If, in the light of the great problems, so pregnant with the good of the race, which have been wrought out in this New World in the last two hundred and fifty years, and wrought so largely by men and women who, if born in any other country on the face of the globe, must have remained "hewers of wood and drawers of water" because their parents were; if in the light of such a history as ours any man can seriously talk of the public school as an injury to any "class" of American society, I am tempted to say, "Though thou bray a fool in a mortar, yet will he not understand." And yet it may be true that our schools are not fully adapting themselves to the greatly changed condition of society as compared with that of even twenty-five years ago, the most marked of which changes is the growth of cities. The door must be kept open for the future Lincolns and Garfields, who have the persistence to push to the top, but we must adapt our schools to the wants of the thousands who will not go to the top. Do they meet the wants of the children of the great cities as well as they have met those of the small cities and the rural communities in the past? Emerson says, "The castle which conservatism is set to defend is the actual state of things, good and bad. The project of innovation is the best possible state of things. Conservatism goes for comfort, reform for truth." Teachers and school officers are not, as a class, prone to defend this castle. They are on the alert for innovations, and it behooves them to think much and act wisely on this point, —the growth of cities. In 1793, the proportion of our population living in cities was 3.3 per cent; in 1840, it had reached 8.5; in 1860, 16.1; and in 1880, 22.5. This means a constantly increasing number of children growing up with idle hands; some of them in pleasant homes, some in the street, but all alike deprived of that invaluable training which comes to the child in the country and in small villages by his hourly contact with material things.

The blood of our cities so far has been kept healthful and vigorous only by the constant absorption of fresh, energetic country life. The rotation is so well established as to be familiar to all. The country boys come to the city; they have had a few weeks each year in the district school; they have risen early and worked hard; their playmates have been domestic animals more frequently than other boys; they have cultivated muscle by day, and read books by night; their hardships have made them strong and self-reliant. By the side of their city cousins they are rude, often uncouth, but they swarm into the cities like the barbarians upon ancient Rome. Like the Goths and Vandals, also, they will conquer, to be in turn rendered effeminate by the voluptuous life they so eagerly seize; their children, most likely, to be reconquered in the same way. Must this be so? What is to be the end? The struggle for life grows intense, as our wilderness becomes populous. Limits are already set to the "Boundless West," which through all our history has been our safety valve. The contests between labor and capital, which have increased so greatly in frequency and bitterness in the last ten years, are but the mutterings of the tempest that is to come, which warn us that the immunity from the ills of over-crowded population which we have enjoyed by reason of our vast extent of unoccupied territory, will soon be ours no longer. What then? Is it possible to educate the town bred child to be the equal in strength, endurance, and moral stamina to his country cousin? Must the children, or the grandchildren, of the men who by industry and frugality win a fortune, die poor? While this remains the rule, it is evident we have not learned how to educate boys and girls under conditions of wealth, and make much of them. Out of this manifest inadequacy of our present method of training city children, both in home and school, has grown the discussion of manual training as a factor in this great problem. Its place is not yet fixed, its results not yet determined. The public school can afford to wait the development of the experiments going forward by private munificence. How extensive these experiments are, under what differing circumstances and influences, may be judged by the fact that in the last twelve years more than ten millions of dollars have been given to found and support technical schools in this country. Such results as we look for, hope for, must be awaited with patience. If it be determined that manual training should have a place in the public schools as a substitute or a supplement, a place will be found for it. The American people will have such schools as they want; never doubt that.

There are not wanting those among us who, having themselves been trained in other lands, and by methods widely different from ours, are sure that we lack almost everything because we have not followed the time-honored models of the Old World. We are told of the extraordinary examinations through which boys are able to pass successfully after being trained in the famous English schools; and again on other hands we are assured that until we adopt the German system of training teachers and supervising their work we must fall far short of the results which are there obtained. Now, first, I remark, that we can best judge a nation's school system by its men and women of forty years, not by its boys and girls of fourteen or twenty. Now, many men trained in the English schools have come among us during the last twenty-five years, and as far as I have heard, they have generally found enough to do to hold their own among our ill-trained Yankees. I do not know enough of the great English schools to discuss them, but until some one convinces me that the pictures drawn in Tom Brown, and the Autobiography of Anthony Trollope are vile slanders, and that these schools are not, and have not been in the recent past, such dens of mediaeval barbarity, as these books represent, I must avow a decided preference for the little red school house of New England, and the log cabin of the frontier, which have given us our Websters, Lincolns, and Garfields.

The German system of supervision, in which an absolute government inspector comes round and winds up the machine over the heads of the people, whose only part is to send the children to school, is doubtless very attractive to a considerable class of educated men, whose confidence in their own theories is confirmed by a chronic distrust of the power of the people to take care of themselves. But the most ordinary school district in America has in it the elements of a broader and more profound system of education, in placing the power and responsibility for schooling the children on the people themselves, and inviting all men to contribute their best ideas, and co-operate in the election of the administrators of instruction. Of course this means a vast amount of crude school keeping, with a perpetual danger of collapse into the slough of partisan politics. But on the other hand, it never fails to educate an increasing body of intelligent men and women, whose indirect supervision of the schools, in the long run, weeds out incompetent teachers, explodes impracticable methods, and does for the children the best thing under the circumstances. At any rate, this is the American way in all things; not the direct, despotic supervision, but the indirect, constant, growing superintendency, that at last creates that atmosphere of intelligent public opinion, which is the most powerful agency for good in this world. This, and only this, is in harmony with the American doctrine that the best government is that which teaches us to govern ourselves.

A number of distinguished writers have told us in recent years, that the schools of to-day lack the efficiency of those of a generation ago; that if we would retrace our steps and reproduce the methods of the instructors of former days, results would be far more satisfactory. Fairly stated, the schools of to-day have no results. We must wait twenty years, at least, for them, and here, I think, is the basal error of those who admire the dead and gone schools of the last generation. They compare boys and girls now in school with men and women who have been twenty or more years in the broader school of life. Judged in this manner, of course our schools must suffer. I have a profound and reverent admiration for the stern men and women who, amid all the terrible discouragements of the early settlement of New England, resolutely insisted that none of the children of the community should be allowed to grow up in ignorance. As Warner so admirably puts it, " The Mayflower did not bring over a sewing machine, but a bit of paper on which was written the charter of human rights and duties. The Pilgrims built a church before they built a ship; they set up a school house long before they thought of a factory. The first seeds they sowed were those of education; they quarried their wealth in chunks of energy, industry and faith out of the old family Bible." But I insist that the claim that these first rude schools, rude because everything else was rude, kept even pace with the improvements of all other social institutions for two hundred years, then halted while everything else continued its onward march, is to say the least, inexplicable, and to be credible must be supported by indubitable facts. What are the facts adduced? In brief, they are the excellencies of the old, often enchanted by distance, compared with admitted defects in the new, or, to put it differently, the men of to-day are compared with the boys of to-day, to prove the superiority of the schools of fifty years ago. When a gray-haired patriarch will sit calmly down and reproduce for us the school of his boyhood as it really was, it is easy, then, to see that the school has been no exception to the general march of progress. Those who have had the privilege of reading the recent articles of Superintendent Harrington, of New Bedford, in the New England Journal, realize how true this is.

I have in my possession an arithmetic printed in 1807, and used by my father. It is, at least, one of the very first of its kind published in this country. I am sure the most sturdy advocate of the old schools, not even Edward Everett Hale or Dr. Hudson, would recommend it as preferable to any now in use. Since instruction began, it has been true that the teacher makes the school, and that among those who wielded the rod—for that was a laborious part of their business--there were doubtless men who roused the nobler impulses in their pupils in spite of the gross *imperfections* of prevailing methods of instruction, and the sickening brutalities of discipline. It is said that our school books are filled with matter which has no connection with practical life. A brief examination of this book proves that the every step of the evolution by which the modern book has grown out of this one, has been an attempt to bridge the chasm between school and business.

I cannot pursue the subject. I stand by the American public school, as it has been, as it is, as it will come to be, with its many human defects, as the best seminary yet devised in which to train American citizens. If everything which England has taught us in the century concerning public education were obliterated, it would leave no void, so they left us Thomas Arnold. He sowed seed at Rugby which is now ripening in both hemispheres. Grand and great as England is, she cannot hold such a man; he belongs to the race and the age. His life has been an inspiration to a generation of teachers; the spell of his influence more potent now, because more widely extended than when he died. Died? Such men cannot die.

To Germany we are indebted for the formula of Froebel —that the mind of the child is a force to be directed, not a magazine to be filled—beyond that we owe little in this department to Continental Europe. The probability is far greater that Germany will adopt our system, in which the people are the source of power in school affairs, as in all others, than that we shall borrow the despotic system of Germany. I have not the space here in which to state my reasons, but I hold to the American school for American children, with the achievements of a century of national life, behind one, to which I point all caviliers.

Does some one say this is but pluming the American eagle? Very well. Let him soar Bid him scream. He's our bird. I would I had space here to quote from the speech made last year in Parliament, by Dr. Labouchere, in which he compared the English board schools with the public schools of the State of Illinois, showing, beyond question, the signal superiority of the Illinois schools.

In 1876 the French government sent a number of gentlemen here—educational experts—for the express purpose of examining our school. I commend their report to that small class of my countrymen who imagine it to be evidence of culture to claim superior excellence for European educational methods. My extracts will be brief: "Need one be astonished, then," say they, "at the frank pride with which the American citizen speaks of his schools? Has he not a right to be proud when he shows us the son and the daughter of the humblest citizen so mentally elevated that between them and the privileged of fortune no difference of culture, no trace of intellectual inferiority, is to be discovered? If it is glorious to see society freely giving to the poor the benefit of a public school education, is it not a still more extraordinary spectacle to behold a nation that deems it would wrong its humblest citizens were their children denied *any* opportunity for the full and free expansion of their minds? So far as social equality can possibly be reached on this earth, it is attained by the American school. In other countries, it is to be feared that the children of different classes of society, though brought together for awhile in the public school, must soon find themselves separated by the whole distance between their respective families. In the United States every effort is made to delay and to diminish this separation, to carry as far as possible, and as high as possible, that common instruction which effaces the distinction of rich and poor. If it be true that the prosperity of a republic is in the direct ratio of the replenishment of its middle classes, of the abundance and facility in the indefinite recruiting of these classes, then the school of the United States is the best investment that can possibly be made."

These are the honest words of educated foreigners, who came here to observe, not to parade their own superiority.

The school of the future will not be that of to-day. The times press it; the changing conditions of national life are laying upon it new burdens, which cannot be shirked; the great Church of Rome has declared open war upon the schools from its every pulpit in the land. These are but the voice of God to the schools, repeating the command given to Moses on the sea-shore, "Speak unto the children of Israel, that they go forward."

We shall not return to the schools of the fathers, albeit there have been, and will be, old gentlemen with kindly memories and a sharp pen, who will bewail the degeneracy of the times. That has been common since the days of Solomon, but we nor our children will take no steps backward in any matter touching the training of the children of the Republic. And now, in severing finally my official connection with the public schools of Colorado, I bid adieu to the people of the State with this sentiment. The American Public School, right or wrong. If right, to be kept right; if wrong, to be set right.

RECOMMENDATIONS.

The changes in the school law, which experience indicates are required, are mostly such as are needed to clear up ambiguities, and render it less liable to be misunderstood. Beyond this and the correction of clerical errors due to the hurry of the last days of the short sessions of the General Assembly, I recommend:

First. That the school year be made to end with June 30, instead of August 31. This will make it coincide with the time for balancing the books of the county treasurer, and save much trouble; and I am advised from the National Bureau at Washington, that June 30 will make our year agree with that of many other States, and hence make a better adjustment of statistics. It will occasion very little inconvenience to district officers, and will give time enough to insure the rendering of the yearly report in season. It will necessitate some change in the time of taking the census, which ought to be done in midwinter, when the majority of district secretaries are not too busy to attend to it properly.

Second. Section 50 should be so changed as to prohibit school boards from paying any member of such board for his services as a member of said board, only excepting the payment of the secretary a reasonable per diem for the time necessarily spent in the duties of his office. Taking the annual census, keeping the district records, and making the lawful reports, are of vital importance to the district, and should be well done and paid for; but the payment of salaries to other members of the board is a perversion of the school fund.

Third. The law should be so changed that treasurers, in districts where no money, or but-trifling sums, will come into their hand, need not be required to give bond.

Fourth. The Special Building Fund should be consolidated with the Special School Fund. The people of a district may safely be left to their own discretion in the disposal of their Special Funds If kept separate, it makes much additional work for the county treasurers, for which there is no adequate gain to the public service. As a matter of fact, many, if not most of the treasurers now keep them as one fund, and the law should be changed to this simple requirement.

Fifth. As to the need of changes in the laws concerning the State Educational Institutions, the reports of the Institutes will speak. I wish to call special attention to the imperative demand of experience for such change in the law concerning the Mute and Blind Institute as will enable the trustees to appoint a competent man as superintendent, who will be in fact the responsible head of the institution in all its departments. Upon no other plan can this or any other institution be successfully conducted.

Sixth. A number of other western States have, by act of Legislature, put the 5,000,000 acres Internal Improvement Land into the Public School Fund. There is a general desire that the Legislature shall transfer the proceeds of the Internal Improvement Land, realized to date, to the Capitol Building Fund. I suggest to the Legislature the desirability of transferring the remainder yet to be derived from these lands to the Public School Fund. Several States have transferred the entire 500,000 acres to their School Fund.

I have been urged to recommend that instruction concerning the action of alcohol upon the human body be made compulsory in the public schools. It is very desirable that some changes be made in our school physiologies, enlarging upon the pernicious effects of stimulants and narcotics, and authors and publishers are recognizing the demand, and meeting it promptly. There are text books already in the market containing the desired amplification on these points; but I am not one of those who expect the dawn of the temperance millenium when all school children receive this special and useful instruction. Among the scores of human wrecks it has been my misfortune to meet, I have yet to know of one who became an inebriate through ignorance of the effects of intoxicating liquor upon both body and soul The question is, as I view it, a question of morals far more than of physiology, and the teaching of correct morals depends upon the *teacher*, not the *law*. The law can inquire into the character of the teacher, but to attempt, by legal enactment, to enforce the teaching of good morals, as if it were arithmatic or geography, is a waste of words. Every district can, if such be the desire of the people, secure such teachers as will give most effective moral instruction, not by set lectures—not by giving so many minutes of the daily programme to the teaching of morality but by remembering;

"That correct example is vitally important as a means of influencing others; that the teaching which tells on character is not chiefly by word; that life is more than logic; character more mighty than catechism. Matthew Arnold affirms that conduct is three-fourths of life. To moral teaching it bears a larger proportion. Truth will have little vitality apart from the personality of the teacher. One must be, in order to do and to teach. A consistent example is the most convincing of arguments. 'Come' inspires conviction; 'go' awakens doubt." A wine drinker cannot be relied on to teach children correctly the effects of whiskey, because the law says he shall do it. Home-brewed ale is no more virtuous than commercial XXX. A genteel tippler has no moral advantage over a ragged toper. Any cherished habit of self-indulgence weakens one's moral influence. Not a few are handicapped in their advocacy of temperance by the quid or cigar. "Who can bring a clean thing out of an unclean?" The American people will have such schools as they believe in and demand, and it is only necessary that any district should realize that the teacher is of more consequence than the law, and it will, if it desire, have temperance taught in the most telling manner without legislative enactment. Without realizing this vital fact, no act of legislature can secure correct moral instruction in the school room.

STATE LIBRARY.

By the use of the appropriation made by the Fourth General Assembly, the library has been shelved, the books cleaned of the accumulated dust of some years of neglect, and arranged and catalogued, and the remainder of the appropriation expended in new books of reference and permanent value, and the bills filed with the State Auditor. A copy of the new catalogue is submitted with this report, which will show what the library now contains.

STATE UNIVERSITY.

To the Superintendent of Public Instruction of the State of Colorado:

SIR · I have the honor herewith to submit the following biennial report:

The Constitution of the State of Colorado provides for the election of a Board of Regents of the University, and defines its duties. While the Boards of Control of the other educational institutions of the State are appointed by the Governor, the members of the Boards of Regents are elected directly by the people, [Const., Art. IX, Secs. 12, 13, 14], thus bringing the management of the University as near the people as practicable. The Organic Act, establishing and providing for the maintenance of the University, was passed by the General Assembly of Colorado March, 1877, and provides as follows:

"The University shall include a classical, philosophical, normal, scientific, law, and such other departments, with such courses of instruction and elective studies as the Board of Regents may determine, and a department of the physical sciences. The Board shall have authority to confer such degrees and grant such diplomas as are usually conferred and granted by other Universities. And the Board of Regents is hereby authorized and required to establish a preparatory department, which shall be under the control of said Board of Regents, as are the other departments of the University. Nothing in this action shall be so construed as to require the Regents to establish the several departments, other than the normal and preparatory, as herein provided, until such time as, in their judgment, the wants and necessities of the people require."

In accordance with the above named provisions, the Board has established, and there is now maintained, a preparatory, a normal, a classical, a scientific, and a medical department.

Since my last report, I believe I am justified in stating that the University has had a constant and healthful growth, as the following statistics and other facts will disclose:

Whole number of pupils in attendance	145
College classes	13
Preparatory school	100
Normal school	31
Special students	17
Medical students	2
Counties of Colorado represented	15
Other States represented	6

ATTENDANCE BY TERMS

		1882—1883.			1883—1884.		
		First Term	Second Term	Third Term	First Term.	Second Term.	Third Term.
Preparatory and Normal Schools	Male	33	28	16	37	25	15
	Female	40	34	25	51	41	33
Literary and Scientific Dept. of Col'g	Male	9	9	7	9	8	7
	Female	3	2	1	1	1	0
Medical Deprtm't.	Male.	...	.	...	2	2	1
Dep't. of Music	Male	....	.. .	. .	3	3	3
	Female	.	.	... .	5	5	5
Totals		85	73	49	108	85	54

Average attendance per diem, 1880-1	63
" " " " 1881-2	60
" " " " 1882-3	69
" " " " 1883-4	86

Amount of orders drawn on General Fund from September 30, 1882, to September 30, 1884:

Regents	$ 1,663 00
Salaries—Professors	32,055 00
Janitor	1,570 20
Fuel	1,090 53
Furniture	1,092 71
Laboratory	164 38
Library	149 91
Buildings and Grounds	1,734 82
Advertising	2,013 02
Telephone rent	240 00
Botanical and Geological Collection	104 80
Stationery	797 77
Sundries	1,972 86
	$44,049 00

Amount of orders drawn on Special Fund from May 10, 1883, to September 30, 1884:

Cottages for Students and President's Residence	$15,017 45
Buildings and Grounds	4,893 36
Library	459 28
Apparatus	77 50
Furniture	704 25
Total	$21,791 84
Total expenditures	$65,840 84

STATEMENT OF RECEIPTS AND DISBURSEMENTS,

Of C. G. Buckingham, Treasurer, of the University of Colorado, from October 1, 1882, to March 17, 1884, both inclusive.

GENERAL FUND.

Received from Treasurer State of Colorado	$ 33,246 44
" " sundry sources	1,020 00
	$ 34,266 44
CONTRA	
Disbursed as per vouchers	$ 35,327 90

BUILDING FUND

Received from Treasurer State of Colorado	$11,700 00
CONTRA	
Disbursed as per vouchers	$3,992 40

RECAPITULATION.

Receipts for account General Fund	$34,266 40
" " " Building Fund	11,700 00
	$45,966 40
CONTRA.	
Disbursed on account General Fund	$35,327 90
" " " Building Fund	3,992 40
Due as per former statement	34 97
Turned over to W. I Jenkins, Treasurer	6,611 17
	$45,966 44

STATEMENT OF RECEIPTS AND DISBURSEMENTS,

Of W. I. Jenkins, Treasurer of the University of Colorado, from March 18, 1884, to October 1, 1884, both dates inclusive:

GENERAL FUND.

Received from Treasurer of State of Colorado	$9,800 00
" " sundry other sources	62 50
Total receipts	$9,862 50
CONTRA	
Disbursed as per vouchers	$8,840 40
Balance, cash on hand	$1,022 10

BUILDING FUND

Received from C. G. Buckingham, Treasurer	$6,611 17
" " Treasurer of State of Colorado	7,900 00
Total Receipts	$14,511 17
CONTRA.	
Disbursements as per vouchers	$14,486 27
Balance, cash in hand	24 90

RECAPITULATION.

Receipts for account of General Fund	$ 9,862 50	
" " " " Building Fund	14,511 17	
Total receipts		$24,373 67
CONTRA		
Disbursements for account of General Fund	$ 8,840 40	
" " " Building Fund	14,486 27	
Total disbursements		$23,326 67
Balance, cash on hand		$1,047 00

The following are the names and titles of the present members of the faculty, with the salary of each:

Joseph A. Sewall, M. D., LL. D., President, Professor of Chemistry and Metallurgy	$3,500 00
Isaac Dennett, A. M., Professor of Latin	2,200 00
Paul H. Hanus, B. S., Professor of Mathematics	2,000 00
Mary Rippon, Professor of German and French	1,250 00
James W. Bell, Ph. D., Professor of Political Economy and History	1,600 00

W. F C. Hasson, (Assistant Engineer U. S Navy), Professor of Mechanics and Applied Mathematics	$1,000 00
J. Raymond Brackett, Ph D., Professor of English Literature and Greek	1,800 00
William R. Whitehead, M. D., Professor of Anatomy and Surgery	1,500 00
Charles Ambrook, M. D, Professor of Theory and Practice of Medicine	*
James H Kimball, M. D, Professor of Physiology, Materia Medica and Therapeutics	*
Thomas H. Everts, M. D, Professor of Obstetrics and Diseases of Women	*
H. W. MoLauthlin, M. D, Lecturer on Pathology and Histology	*
George Cleary, M. D, Lecturer on Opthalmology and Otology	*
Edward C. Wolcott, Librarian	175 00
W H Mershon, Licensed Instructor in Music	No salary

*Salary made contingent upon continuation of appropriation by the State

NORMAL SCHOOL.

In arranging the course of study of the Preparatory and Normal schools, it was deemed advisable, as the Faculty is so limited in number, and the classes so numerous, to combine the first and second years of the course in the two departments. Arrangements will be made, however, to give a course of lectures on Pedagogy for the benefit of students who do not complete the course, but who will, as undergraduates, teach in the schools of the State. By adopting this plan of combining the academic work of the two schools for the first and second years, the standard of the Normal School was not only placed much higher, but together with other minor changes, the Board was enabled to reduce the annual expense for salaries $4,450.

MILITARY.

The State having supplied the University with rifles, a cadet corps has been organized under efficient discipline. None but students at the University are admitted to the corps. Students desirous of becoming members at their own discretion, present a written application to the commandant. This application being accepted, the student becomes subject to the regulations governing the corps, and his option ceases. The commandant reserves the right to reject any application. The cadets are drilled in the schools of the soldier and the company. The corps numbered thirty-two during the year 1883-4. The cadets make a commendable appearance in ranks, and their general carriage and manners are improved in a marked degree. The cadet officers are instructed by Assistant Engineer W.

F. C. Hasson, U. S. Navy, who was detailed July, 1883, by by the Secretary of the United States Navy, to give instruction in mechanics and engineering at this institution

LITERARY AND SCIENTIFIC DEPARTMENT

The entire department has been remodeled, and now offers to students one hundred and ten courses in seventeen branches of literature, language, mathematics, and physical science.

PREPARATORY SCHOOL.

In order to place the standard of admission to the various departments of the University on an equality with the ranking institutions of the United States, the course of study in the Preparatory School has been extended from three to four years.

During the two years, fifteen have completed the Preparatory course of study, and received certificates. Three have completed Collegiate courses, and received degrees; two receiving the degree of B. S., and one B. A.

Since my last report, extensive alterations and improvements have been made in the University buildings; the library has been enlarged; several small rooms on the third floor have been thrown into one, affording a commodious lecture room, a large well ventilated dissecting room, furnished with lead floor, dissecting tables and water supplied.

The auditorium or chapel has been furnished, making as fine a room as there is in the State. Additions have been made to the furnishing of the several class rooms in the way of tablet settees, wall maps, charts, etc.

About one thousand dollars' worth of books have been added to the library; two hundred dollars of which was donated by Mr. C. G. Buckingham.

The following instruments have been furnished for the departments of surveying and engineering.

Gurley's engineer's transit, with solar attachment; Gurley's Y level [20 inch] and New York rod; Chesterman's steel tape; brazed steel chain; set of marking pins.

A team of horses was purchased in the spring of 1883, from the proceeds of land donated to the University by Mr. Wm. Arnett, 1875, and has been constantly and profitably employed in working upon the grounds, hauling coal, etc.

In addition to these substantial improvements upon and in the main buildings, a portion of the ground has been cleared of boulders, and two stone bridges have been built, each containing about three hundred tons of stone.

Five additional buildings, including the hospital, have been built, costing in the aggregate about twenty-three thousand dollars.

MEDICAL DEPARTMENT

Since my last report, the School of Medicine and Surgery has been established as a department of the University. It was estimated that not less than one hundred prrctitioners of medicine were coming to Colorado each year, and a careful investigation of the report of the State Board of Medical Examiners for 1883 indicates the fact that this supply, in many instances, was not of the most desirable quality. Yet the fact of their coming and finding remunerative employment indicates a demand for competent medical practitioners. And as it seems to be the settled policy of the State, as indicated by its constitutional and legislative acts, to present its educational advantages to all classes of its citizens seeking education, technical, literary, or professional, the Board of Regents believed that the time contemplated in paragraphs 2748 and 2758 of the general laws had arrived, and the taxpayer whose son desired to study medicine had the same rights as his brother who was receiving instruction in agriculture, mineraology, chemistry, civil or mining engineering, surveying or pedagogy. Conceding that all the taxpayers had a right to the fostering care of the State in conserving their health, so far as to give to those desirous of following medicine as a profession, opportunity to acquire the necessary knowledge, the Board of Regents unanimously decided that the medical department should be organized and maintained. In August, 1883, the Board appointed a Professor of Anatomy and Physiology, who entered upon his duties in September, 1883.

There was little opportunity for the proper advertising of the school before the opening of the term, and as it was deemed best to limit the new department to first year students, thus obviating the necessity of appointing a full corps of instructors, and at the same time making the expenses of the first year as small as possible, this plan compelled the faculty to reject several applicants who were advanced in their standing; with these provisions two students were matriculated.

In August, 1884, the Board made the necessary arrangements for the appointment of a corps of teachers for the medical department, and for the erection of a hospital upon the grounds of the University. The Board recognizes the fact that the hospital should be entirely under the control of the medical faculty, and all who are conversant with the history of hospital management will heartily approve its action in this particular, and the necessity of such an institution for the purpose of giving practical bed-side instruction to those to whom the State would in the near future look as protectors of the public health, is apparent to all.

The hospital is situated upon the southeast corner of the University grounds, easy of access to students. It is modeled after the plan of the United States Army Post Hospitals, having two wings or one-story wards attached to a central administrative building, with a rear extension divided into kitchen, dining room, and store room. The central building and one wing or ward has been erected, and the other wing can be added when needed, and in the future, should the number of patients make it necessary, the accommodations can be indefinitely increased, at a minimum cost, by adding wards at right angles to those already erected, thus securing most of the advantages of the pavilion plan at the least possible cost.

The hospital, when opened (January 1, 1885) will accommodate thirty patients; it is intended to receive all classes of patients except cases of contagious diseases, which will be cared for in special quarters provided for them away from the University grounds.

The hospital is for any sick person who can pay from seven to fourteen dollars a week, according to accommodations; at present no free beds are provided, but such may be arranged for in the near future.

The present medical faculty is as given above.

The term of study extends over three years of nine months each, and the studies are so arranged that they can be pursued in courses of first, second and third years, or in mixed classes.

The question of fees was duly considered, and it was thought that as the State gave instruction free in all its institutions, academical, technical and agricultural, there could be no good reason for a new departure in its medical school. If onerous tuition fees were charged, it would present the spectacle of making the noblest pursuit, that of making preparation for alleviating human suffering, dependent upon mere money qualifications, and not ability, and this decision has additional weight from the fact that at the Agricultural College, Veterinary Surgery is taught without fees. The inference is that the State is willing to do as much for its citizens as for its animals.

This being the first year that it was announced as a Medical School, teaching all branches, is practically its first year, and its success is gratifying to all its friends, there being sixteen matriculants.

The requirements for admission are: A Degree in Arts or Sciences, a High School Diploma, or a satisfactory examination equivalent thereto.

The requirements for graduation are: Three years' study, actual dissection and chemical laboratory work, with not less than two courses of lectures, three being recommended, and satisfactory examinations, both written and oral.

EDUCATION AND THE STATE.

We boast of our free institutions—of the democratic idea. We proudly exclaim and declaim that in our country there is no lordly aristocracy, no great kingly power to crush, no oppressing ecclesiastical authority to which we are subject and must bow. But with all our boasting, we feel that though we all have equal civil and religious liberty in the fullest measure; though the poorest man stands the same before the law as the richest; though each is permitted to worship God according to the dictates of his own conscience, and the poorest and lowliest citizen has the same political rights as his richest and proudest neighbor—still we somehow have a smouldering idea, a dim belief, that there is after all a class distinction, a seeming aristocracy, which the more we contemplate and investigate, appears the more real. The aristocracy of wealth.

The masses growl "monopoly;" the partisan press finds it convenient to utilize the fact as political capital, and the pulpit lays great stress upon the text relating to the camel, the needle's eye and the rich man. Now, if it be true that there is an aristocracy of wealth springing up; if our boasted equality of rank is only seeming; and if it be true that though the masses have equal civil and political rights with the select few, yet it is apparent and true that while these civil and political rights have been given in the fullest measure, at the same time social equality has been lost, and castes have been established, class distinction based upon wealth.

The free public schools of our country, giving to all children, rich and poor alike, an opportunity to secure a common school education, acts as a partial leveler, and tends to make class distinction less marked; while higher educational privileges—the State Universities and Colleges—go far to neutralize the evil tendencies of great unequal distribution of wealth. Abolish the free or State institutions of higher education, and in a short time there would arise an aristocracy based upon wealth and intelligence, and the few, with these elements of power, wealth and intelligence, could and would hold control of the great majority. For poverty with ignorance is no match for either wealth or intelligence.

In fact, the free public school system seems to be the one great efficient bar against a despotism of wealth and intelligence; a despotism as strong and as hard and as cold as any that ever rested upon a people.

THE PRACTICAL IN EDUCATION.

There is a strong tendency in the present age to regard what is called *theoretical* in education as of no value; in fact, making it synonymous with impractical.

The *practical* is what is demanded.

But in demanding the practical, it is well to consider the source from which this practical comes.

Do engineers build the bridges that span the rivers, and then construct theories with regard to the transmission of strains and stresses? Are lines of irrigating ditches constructed before the development of theories with regard to the flow and velocity of streams?

When a thorough and exhaustive study of the structure of a grain of wheat had been made—and it was a marvelous study, the results of which filled a large volume—the miller applied the theory derived from this purely theoretical study and investigation, and made more and better flour from a given quantity of wheat.

The only real is the ideal. The only practical is an outcropping of this ideal. Every machine that is used by man, from the simplest to the most complicated, is but an imperfect material representation of the ideal that preceded. The steam engine with all its complications is only an idea stamped in the material The idea is greater than the material, inasmuch as the idea is the progenitor--the creator--while the material—the machine—is the product, the created.

The Ancient and Modern Languages, Higher Mathematics, Science, Philosophy, and the rest, are non-practical studies; but somehow experience has taught us that the pursuit of these studies develops and makes strong men.

The clicking of the telegraph and the speaking of the telephone were heard before a pole had been set, a wire stretched, or a battery charged. The whole apparatus was set up and tested in the brain of the inventor before it passed into the material—the actual—the practical.

Froude, England's great historian, says:

"If this age is to stake its reputation on steam engines and money getting, on its rejection of what ages have proven good in education, morals, society, to gain what is merely practical, the dreariest farce in history will have been acted, and men will see it in that light when impartial minds shall, a few hundred years from now, sit in judgment on what we have done."

The purpose for which the institution was established is clearly set forth in the language of the Organic Act. And what has been done by the Board of Regents and by the Faculty accords as nearly as possible with the spirit and intent of that organic act. The best and truest friends of the institution, those best acquainted with its affairs, do not claim for it perfection, that the results are all that could have been wished.

Let the institution be judged by the results attained. But let the judgment be candid, honest, and intelligent, let it be based on truth and not on some irresponsible "they say," or the biased testimony of prejudice.

We desire that what *is done*, should be known and understood. If any citizen wishes to know what is here being done for the promotion of higher education, let him come and see. He shall have full opportunity to observe and judge for himself.

Respectfully submitted,

J. A. SEWALL,

President of the University of Colorado.

MINIMUM REQUIREMENTS IN CERTAIN SUBJECTS

For Admission to the University of Colorado.

Such a course of study for the State Preparatory School has been prescribed as, in the judgment of the Faculty, best prepares for college. The University has no intention of lowering its standard, and all candidates are urged to do the work prescribed in its preparatory course. But students will be admitted from schools not having instructors enough to teach all the branches required, provided the course is, in other respects, sufficiently thorough and extended. The following work, however, cannot be omitted:

I.—Minimum requirements of candidates for courses leading to the degree of Bachelor of Arts:

*1. LATIN.—*Latin Grammar.*—A thorough preparation in the elements; Jones's Latin Prose Composition, or an equivalent in Harkness or Arnold; Cæsar—four books of the Gallic war; Cicero—three orations; Virgil—first six books of the Aeneid.

2. GREEK.—Hadley's or Goodwin's Greek Grammar; White's Lessons; Jones's Greek Prose Composition; Xenophon—Anabasis, four books.

3. MATHEMATICS.—*Arithmetic.*—Common and decimal fractions; compound numbers, including applications of the metric system; percentage; interest; involution and evolution. *Algebra.*—Through quadratic equations, *i. e.*, as much as is contained in Olney's Complete Algebra, omitting the Progressions and the "Business Arithmetic." *Geometry.*—Plane Geometry, *i. e*, the first five books of Chauvenet, or as far as Article 380 of Olney's Geometry.

4. ENGLISH.—An essay on a subject assigned at the time of examination. In 1885 the subjects will be taken from Shakespeare's "Merchant of Venice," Hawthorne's "Scarlet Letter," Bryant's "Thanatopsis;" in 1886, from Shakespeare's "Hamlet," Longfellow's "Evangeline," Webster's "Reply to Hayne."

5. HISTORY.—Roman History, to the death of Commodus; outlines of General History.

II.—Minimum requirements of candidates for courses leading to the degree of Bachelor of Science:

1. LATIN.—Latin Grammar—Etymology and Syntax; Latin Lessons; Cæsar—four books of the Gallic War.

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*NOTE.—These requirements cannot be regarded as fixed. The continuous growth of the University, and the consequent extension of the courses of study will very probably necessitate considerable additions at an early date. For further information see University catalogues.

2. SCIENCE.—*Chemistry.*—Eliot and Storer's or Roscoe's Elements, omitting Organic Chemistry. *Botany.*—Gray's Lessons. *Physics.*—Gage's Elements of Physics, or Avery's Elements of Natural Philosophy.

3. MATHEMATICS —All the mathematics required under I., and in addition as follows: *Solid Geometry*—nine books of Chauvenet's Geometry; *Algebra*—Olney's Complete Algebra entire, including an elementary knowledge of logarithms.

4. ENGLISH —As under I.

5. HISTORY.—Outlines of General History.

III—Requirements for admission to the Normal School:

Candidates for admission to the Normal School must have passed the entrance examination to the Preparatory School, and have completed the work of the first two years, or its equivalent.

J. A. SEWALL,
ISAAC DENNETT,
PAUL H. HANUS,
Committee on Minimum Requirements.

STATE AGRICULTURAL COLLEGE.

REPORT OF THE PRESIDENT.

To the State Superintendent of Public Instruction:

SIR: In accordance with the requirements of the act of the General Assembly of the State of Colorado, approved February 11, 1881, I hereby submit the biennial report of the State Agricultural College, showing its growth and development, and in part the public work which it is now performing for the benefit of the State.

The former report was submitted soon after the reorganization of the college on a firm industrial basis, which was designed to make this institution something more than an industrial college in name. How well the present management have succeeded in this work, it is the province of this report to show, and whatever success has been attained has, in large measure, been the result of a steady course pursued both by Board and Faculty, and also to the fact that few changes have been made.

The present Board, with terms of expiration of office, is as follows:

STATE BOARD OF AGRICULTURE

B. S. La Grange, Greeley	February,	1891
W. F. Watrous, Fort Collins	"	1891
John J. Ryan, Loveland	"	1889
Henry Foote, Del Norte	"	1889
David Boyd, Greeley	"	1887
Ozro Bracket, Frankstown	"	1887
Hon. R. A. Southworth, Denver	"	1885
*G. W. Rust, Boulder	"	1885
His Excellency, Governor James B. Grant,	*Ex-officio.*	
President, Charles L. Ingersoll,		

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*Elected to fill vacancy caused by the decease of P M Hinman.

OFFICERS

David Boyd	*President*
W. F. Watrous	*Secretary*
Fred Walsen (ex-officio)	*Treasurer*

The present Faculty, with salary paid each member, commencing September 1, 1884, is as follows:

FACULTY OF INSTRUCTION.

	Present Salary.
Charles L Ingersoll, M S., President, Professor of Political Economy and Logic	$2,500
Ainsworth E. Blount. A. M, Professor of Agriculture, Superintendent of Farm	1,800
Charles F. Davis, M. S., Professor of Chemistry and Physics	1,400
Elwood Mead, B. S, C. E, Professor of Mathematics and Engineering	1,400
James Cassidy, Professor of Botany and Agriculture, Superintendent of Department	1,400
James W. Lawrence, Professor of Mechanics and Drawing	1,400
George C. Faville, B S, D. V M, Professor of Veterinary Science and Zoology	1,400
Miss Ella Silcott, Instructor in Vocal and Instrumental Music	*—
Mrs C. L. Ingersoll, Matron of Ladies' Dormitory	400
W F. Watrous, Secretary of State Board and Faculty	400

*No salary—paid entirely by music fees.

The salaries paid are, in the main, much below those paid elsewhere for the same quantity and quality of work.

The faculty is largely composed of young, enthusiastic workers, and thorough work has been done by all.

To some, the faculty may seem large, but when they know that twenty recitations are conducted each day and that from five to nine squads of students are at labor in the various departments, as farm, garden and conservatory, mechanic shop, dissecting-room chemical laboratory, or field surveying, for two hours daily, and that this labor must be performed under the eye and direction of the instructor, they will then see that each professor has all the work he can perform. Indeed, several are overworked when they undertake the investigation of questions which need to be answered for the people of the State.

The attendance at the College has increased in a steady and regular ratio, until the present term, when there has been quite a notable increase. One feature of the attendance during the period covered by this report is, that the students have remained for a longer period of time, and have become much more attached to the College and its work; they have, also, more and more, taken the regular course.

The College sent out its first graduating class at the commencement held June 7, 1884. The class of three consisted of two gentlemen and one lady, and all were natives of Colorado. Two were residents of Larimer county, and the third was from Longmont, Boulder county.

The present senior class has six students, and the lower classes have increased numbers, so that in the college we have in—

College classes (regular)	44
" " (special)	16
" " (past graduates)	3
College classes (total)	63
Preparatory class	22
Total attendance	85

This is the daily attendance in classes at date of this report.

The table of attendance showing the number of each sex and the attendance by terms, together with averages,—is given below:

ATTENDANCE.

TERMS.	1883.			1884.		
	Male.	Female.	Total	Male.	Female	Total.
First (winter) term	39	23	62	32	31	63
Second (spring) term	23	21	44	22	32	54
Third (fall) term	31	31	62	37	45	82
Average attendance	31	25	56	30½	36	66⅔
Total enrollment	51	39	90	53	52	107

The present course of instructions and labor is tabulated and annexed:

COURSE OF INSTRUCTION AND LABOR.

PREPARATORY YEAR.

1st Term.	Arithmetic. } 20 weeks	Elocution.	El. Physiology.	English Analysis	Labor on farm, 2 hours.
2d "	" El. Algebra.	U. S. History.	Phys. Geography.	" "	Shop practice, "
3d "	" } 20 weeks	" "	Penmanship.	Word "	Labor on garden, "

FRESHMAN YEAR.

1st Term.	Geometry.	El. Rhetoric	Drawing	Agriculture Lectures	Shop practice, 2 hours.
2d "	Geometry, completed	Book Keeping	"	Botany.	" " "
3d "	Algebra.	History (Ancient).	"	"	Labor on farm, "

SOPHOMORE YEAR.

1st Term.	Algebra, completed.	History (Con.)	Drawing.	El Chemistry.	Laboratory practice, 2 hrs.
2d "	Trigonometry.	English Literature.	"	Organic Chemistry. Zoology.	Shop practice, "
3d "	Surveying	" "	"	Zoology.	Field surveys and levels

JUNIOR YEAR.

1st Term.	Physics.	Rhetoric	Geology.	Agricult'l Chemistry.	Chemical analysis, 2 hrs., Lab. work.
2d "	"	Floriculture.	Anatomy, 6 weeks. Physiology, 5 weeks.	Agriculture Lectures.	
3d "	Microscopy.	Horticulture.	Physiology	Entomology.	Labor on garden, 2 hours, or Microscopy.

SENIOR YEAR.

1st Term.	Chemical Physics.	Landscape Gardening	Veterinary Science.	*Psychology.	Mechanics, 2 hours shop practice.
2d "	Meteorology.	Moral Science.	" "	Logic	
3d "	*Astronomy.	U. S. Constitution.	" "	Political Economy	Clinics, Friday.

* Elective with Irrigation Engineering.

HISTORY.

At the close of the previous report the faculty was composed of (4) four Professors, a Superintendent of Floral Department and a Farm Superintendent; the increased labor incident upon the addition of our full line of study and labor for the (5) years of the course, made it necessary to have more assistance.

Accordingly, at the last meeting of the State Board of Agriculture, held in 1882, the chair of chemistry and mathematics was divided, and Prof. Charles F. Davis retained as Professor of Chemistry and Physics, while the new chair of mathematics and engineering was created, and Prof. Elwood Mead, B. S, C. E, a graduate of Purdue University, and formerly connected with the United States topographical survey in the Ohio and Wabash Valleys, was called to take charge of the department.

In February the Floral Deportment was consolidated with the Horticultural, which was in charge of the Farm Superintendent, temporarily, and Prof. James Cassidy, of Michigan Agricultural College—a horticulturist of many years' experience and acknowledged ability—was called to the chair and placed in charge of the new department.

On March 21, 1883, Prof. Frank H. Williams, M. E., resigned, and Prof. James W. Lawrence, from Boston Institute of Technology, was elected to the chair of mechanics and drawing, to fill vacancy caused by resignation. The chair was very ably filled and the work of the department went on almost without a break.

In August, 1883, the new department of Veterinary Science and Zoology was created, and Prof. George C. Faville, B. S. D. V. M., was called to the chair and put in charge of the department. The doctor is a graduate of the Iowa Agricultural College in both degrees, and a very valuable accession to our college and State, in everything which pertains to his line of work.

The Music Department was added to the list April 1, 1884, in order to give all students, but more especially the ladies, the opportunity to become proficient in this branch, which has almost ceased to be considered an accomplishment, but a necessity, in every well-regulated home. Miss Ella Silcott, a graduate of the Music Department of Simpson Centennary College in Iowa—a lady highly recommended—has taken charge, and is giving excellent satisfaction.

The college has thus in two years been expanded to cover all the lines of work intended in the reorganization, and has the following distinct departments, viz.:

Agriculture.
Horticulture and Botany.
Chemistry and Physics.
Mathematics and Engineering.
Mechanics and Drawing.
Veterinary Science and Zoology.
Music.

And, as thus organized, touches all the material interests in the State except mining, and this incidentally in the engineering and mechanics and drawing, thus teaching our students how to build houses or machinery and operate the same, while the Veterinary Department assists in all questions of diseased stock, of which the stockmen have stood in so much fear during the past year.

LEGISLATION.

The last Legislature of the State passed an act creating a levy of one-fifth mill, annually, on each dollar of valuation; it also passed an act appropriating the sum of ten thousand ($10,000) dollars, for mechanic shop and conservatory.

At the last session of Congress was passed an act making immediately available the 90,000 acres of land donated to the college, and this is being located for the future endowment of the college, when sold.

In the meantime, however, the State will be obliged to aid the school until the college can begin to realize from the endowment.

IMPROVEMENTS.

With the appropriation of $10,000, by adding some from one-fifth mill tax, we have erected a mechanic shop and equipped it well, at a cost of nearly twelve thousand ($12,000) dollars, and a conservatory, with improved apparatus for heating, at a cost of two thousand seven hundred ($2,700). We have also introduced water from the City Water-works into the buildings for convenience and fire protection, and also have a good hydrant upon the ground, from which all the buildings can be reached; this cost about $1,500. The building, originally erected for a barn, was changed into a chemical laboratory at a cost of $1,450. This is the most complete in all its appointments of any laboratory in the State, though not as large as some. Water and gas are on each desk, and ventilating hoods keep the room clear of noxious gases, while the building is thoroughly plumbed for sewage. The grounds have been rapidly improved, so that even now we have one of the most attractive places in the State. In apparatus we have added largely to the Chemical Department, in machinery to the Mechanical Department, in instruments to the Engineering Department, and in surgical instruments and other material to the Veterinary Department, while our museum has grown to be the best general museum in the State, illustrating botany and forestry, zoology and comparative anatomy. The library has more than doubled and is growing rapidly. On the farm more fine stock has been secured, including some Clydesdale horses, while we have our conservatory filled with choice plants, many of economic value, and largely by the donations of friends of the institution.

EXPERIMENTS

The college has laid out an experimental ground of nearly twelve acres, which is entirely devoted to the comparative growth and treatment of all kind of farm products. The farm is carried on experimentally to some extent. The gardens are devoted largely to experimental work on vegetables, while the conservatory has been the scene of a large number of seed tests this year. The Chemical Department has been examining soils, corns and waters from different parts of the State, and conducting a series of observations tri-daily, during the growing season, on soil, temperatures and the way in which soils are affected by irrigation The Veterinary Department has been paying its attention to the so-called foot-and-mouth disease, Texas fever and "loco" poisoning of stock. The Engineering Department has been working a large portion of this year in conjunction with the State Engineer in gauging the streams and ditches of Colorado and in making experiments on the flow of water with the new instrument—a self-registering fluviameter—devised by our State Engineer and purchased by our college These experiments in due time will be published for the benefit of the people of the State, and will represent in part the interest and self-denying labor performed by our faculty during the summer vacation, when teachers in other institutions and other lines of work are spending their vacation in recuperation and rest.

The valuable agricultural display from our college, which has been at the Denver Exposition, and which never has been equalled in the United States, will be sent to the New Orleans World's Exposition—there to advertise the resources and possibilities of our State, while a fine educational display will be sent from other departments. The work of the college is thus threefold in its character:

First—Giving instruction such as shall educate mind, eye and hand, and send into the varied industries of the State men and women trained to make the best self-supporting citizens, those who will add to the material wealth of the State.

Second—To experiment in directions where private industry cannot, or will not, and put the results before the people for their benefit.

Third—To exhibit the work of our hands in various lines and call attention to the resources which lie hidden, as it were, in our soil, water and climate, and to protect the great stock interests of the State by the use which we can make of our Veterinary Department.

In closing, let me quote from Hon. J. L. Dow, M. P., of Australia, who spent several months in America investigating her resources, schools, systems of railroad, etc., etc.

After having examined into the workings of one of the oldest colleges of its class in the United States, and after having visited several colleges of the same kind in Canada and the United States, he says, in a book published in Melbourne on his return: "The Colorado Agricultural College, which although the youngest, is one of the best managed establishments of the kind in America." That we may be able to keep it up to this standard now attained, and even to improve upon it, is the earnest wish of each member of the faculty and the State Board of Agriculture, who have the institution under their supervision.

C. L. INGERSOLL,

President.

STATE SCHOOL OF MINES.

GOLDEN, COLO., December 1, 1884.

To the Superintendent of Public Instruction of the State of Colorado:

SIR:—I have the honor herewith to submit the following report:

The general objects of the School of Mines, its courses and schemes of instruction, having been frequently set forth, both in its catalogues and in the last biennial report, it is thought unnecessary to recapitulate them in detail in the present one.

Since the biennial report of 1882, the new building has been completed, and during the winter of 1883-84 its outfit was increased by the addition of a laboratory, designed for the use of the Professor and Instructor in Chemistry, for advanced students, and more especially for conducting scientific or technical investigations. The work done in the latter direction during the present year will be described later. The lecture-room for Physics has also been fitted up since the same date.

The number of students attending during the school year 1882-83 was sixty-nine; ladies taking instruction in drawing, sixteen; total, eighty-five.

The number attending during the school year 1883-84 was forty-nine; ladies attending as above, seventeen; total, seventy-six.

The number of students from Colorado is usually somewhat greater than from all other States and Territories combined. It may, however, be stated (although the present report properly carries the record only to September 1) that at present the Colorado students, exclusive of ladies, are exactly equal in number to those from other States. In the past, single or "special" courses of instruction have been preferred by a majority of the students, but at present the tendency is toward full or regular courses. This is quite in accordance with the views of the present faculty, and new-comers are advised in all cases to take a regular course if possible.

It is not intended by any means to exclude special courses from the scheme of studies, but to expand them into something more than a *single* specialty. Thus, students in Assaying are required to pursue a laboratory course, besides lectures on General Chemistry and Stoichiometry, and attain a practical knowledge of quantitative operations, of which furnace work is but a single branch.

In the Chemical Department instruction in practical analysis is much more efficacious with the present facilities, and the improvement, both in the amount and quality of work done, over that accomplished before the completion of the present laboratories, is very marked. Advanced work in Analytical Chemistry is now being pursued by some of the students, for the first time since the opening of the school

In connection with the courses in Mining Engineering, Geology and Metallurgy, excursions have been made to various points during the last two years. These have been to Central, Georgetown, Idaho Springs, Canon City, Manitou, Pueblo and Leadville. Three more are in prospect for the present school year. Our thanks are due the management of the Denver and Rio Grande and Union Pacific Railroad Companies for reduced rates, whereby many students have been enabled to take these trips who would otherwise have been compelled to forego their advantages. Under direction of the professor in charge, each student is required to take full notes, and to write a descriptive thesis upon some subject connected with the trip. The benefit of thus combining active field work with the regular course, is sufficiently obvious.

The corps of instruction is, at present, constituted as follows:

REGIS CHAUVENET, A. M., B. S., *Professor of Chemistry and Assaying. Salary,* - - *$3,000 00*

ARTHUR LAKES, *Professor of Geology and Drawing. Salary,* - *$1,500 00*

MAGNUS C. IHLSENG, E. M, C. E., Ph. D., *Professor of Engineering and Physics. Salary,* - *$1,800 00*

PAUL MEGEE, Ph. D., *Professor of Mathematics. Salary,* - *$1,000 00*

GEORGE C. TILDEN, C. E, *Instructor in Chemistry and Assaying. Salary,* - - - *$900 00*

Previous to the last biennial report there was no Professor of Mathematics, the subject having been taught by the Professor of Engineering and an assistant. On the other hand, it has been found practicable to reduce the corps somewhat for the year 1884-85, by re-distribution of duties among the present members, so that no new appointments have been made to fill the vacancies caused by the resignations of Professor Moss and Dr. Mackenzie. Although not intended as permanent, this reduction of force can be maintained without disadvantage during the present year, and will materially aid in extinguishing the debt of the school.

The necessary expenses of a technical school, outside of salaries, are, of course, greater than those of an institution where theoretical instruction only is given. A very large portion of the expenditure of the past two years is not to be charged to current expense, but to apparatus, fittings, and various appliances indispensable for any technological school, and which the School of Mines has had to supply from its annual income. It is only slowly that the full outfit of a school of this kind can be thus brought to completion, but we can now fairly say that our heaviest expenses are over, and our laboratories and assay-rooms are inferior in convenience and appliances to none in the West. No other institution of similar scope and facilities now exists between the Missouri River and San Francisco, and in the two years just passed, not one of the mining States or Territories has been without one or more representatives among the students.

During the past season the Board of Capitol Managers, having in charge, among other details, the selection of a suitable building material to be used in the construction of the new Capitol, resolved to submit all the samples of stone sent to them to chemical and physical tests. No satisfactory report having been obtained from other sources, the matter was referred to the State School of Mines.

As, in the view of the Trustees, investigations of this kind, of direct benefit to the State and of general interest, form a part of the proper functions of the school, no charge was made for the work. The report of the Board of Capitol Managers has been published, and that portion of the same undertaken by the School of Mines has been separately issued, and is transmitted herewith. It is believed that few States have as complete a record of their available building material as is presented in these publications.

It should be mentioned, as showing that the school is becoming favorably known, that applications have been made to it at several times during the past two years for chemists and assayers, to fill vacancies in this and other States and Territories. It has usually been practicable to answer at once, and furnish a competent incumbent from among the more advanced students or graduates. As it had been suggested that it might be a matter of interest to many to learn the present occupations of students who have left the school after taking more or less complete courses, inquiries were made resulting in the formation of a tolerably complete record, which is given below. It comprises all whose present residence and occupation is known, and who left the school from the spring term of 1881 to the same term of 1884. It will be seen that seven-eighths of the whole number are in Colorado and the mining Territories:

RESIDENCES BY STATES.

Colorado	53
Montana Territory	5
New Mexico Territory	6
Nebraska	1
Idaho Territory	1
Utah Territory	1
Kansas	1
Illinois	2
Oregon	1
Dacotah Territory	1
Arizona Territory	1
Wyoming Territory	1
California	3
Wisconsin	1
New York	2
Total	80

OCCUPATIONS.

Assayers	21	Students	4
Superintendents	5	Journalists	2
Mining	12	Real estate	2
Mining experts	2	Lawyers	2
Railroads	8	Druggist	1
U. S Deputy Surveyors	10	Total	80
Lumber	3		
Chemists	8		

RECEIPTS AND EXPENDITURES

The books of the Secretary of the State School of Mines and of the Professor in charge, from September 1, 1882, to November 30, 1884, show the following receipts and expenditures for the time noted, two years and two months:

DEBIT

Warrants drawn on State Auditor since last biennial report, viz.	
From September 1, 1882, to September 1, 1883	$29,100 00
From September 1, 1883, to November 30, 1884	27,398 30
Total for twenty-six months	$56,498 30
Receipts from students since last biennial report, viz	
From September 1, 1882, to September 1, 1883	$1,608 50
From September 1, 1882, to November 30 1884	1,753 77
Total for twenty-six months	$3,362 27
Total receipts from all sources for twenty-six months ending November 30, 1884	$59,860 57

CREDIT

Vouchers issued for approved accounts since last biennial report, viz	
From September 1, 1882, to September 1, 1883	$32,488 42
From September 1, 1883, to November 30, 1884	21,842 13
Total expenditures	$54,330 55
Suspense account (due from Everett's bank)	2,400 19
Grand total September 1, 1882, to November 30, 1884	$56,730 74
Total receipts September 1, 1882, to November 30, 1884	$59,860 57
Expenditures and suspense account ($56,730 74) less cash in hands of Treasurer ($328.39)	56,402 35
Reduction of debt since October 12, 1882	$3,458 22

DETAILS OF EXPENDITURES.

	1882-83.*	1883-84 †
Building and grounds	$12,996 90	$ 545 41
Furniture and fittings	2,459 62	1,042 30
Permanent apparatus	301 80	647 88
Library	217 68	185 29
Salaries	7,898 42	12,326 39
Repairs	607 88	722 11
Supplies (chemicals and apparatus)	3,850 83	3,089 69
Fuel, light and incidentals	472 81	642 05
Printing, advertising and stationery	1,680 02	890 63
Interest, insurance and expense accounts	2,002 46	1,750 38
Totals	$32,488 42	$21,842 13
Total for twenty-six months	....	$54,330 55

* Twelve months. † Fourteen months.

STATEMENT OF SCHOOL DEBT.

Debt of school October 12, 1882	$9,463 36
Debt of school November 30, 1884	6,005 14
Reduction in two years	$3,458 22

The present debt of the institution ($6005.14) is covered by over-drafts on the State Auditor to the amount of $6,500, which, when paid from taxes levied and in course of collection, will more than meet liabilities outstanding at the date of this report, November 30, 1884.

The Treasurer of the institution, Hon. F. E. Everett, who was also filling his third term as a member of the Board of Trustees, committed suicide at Golden, July 17, 1884, at which time his indebtedness to the school, as shown by the books of his banking house at Golden, was $2,400.19, which amount is added to the expenditures for 1884. The affairs of the bank are now in process of settlement, and such amount as may be received of the indebtedness stated will go towards still further reducing the debt.

On July 30, 1884, Moritz Barth, Esq., of the City National Bank, Denver, was elected Treasurer of the school, and at the meeting of the Board of Trustees, held August 21, 1884, the bond of the Treasurer, in the sum of $10,000, with William Barth and John C. Kaufman as sureties, was formally accepted and placed in the hands of the President of the Board.

From the date of his qualification, August 21, until November 30, 1884, Mr. Barth received from the State Auditor $5,298.30, and in cash from the Secretary of the Board of Trustees $286.70, making $5,585, out of which he paid warrants to the amount of $5,256.61, leaving $328.39 as cash on hand.

Respectfully submitted,

FREDERICK STEINHAUER,

President Board of Trustees.

INSTITUTE FOR MUTE AND BLIND.

COLORADO SPRINGS, December 2, 1884.

Hon. J. C. Shattuck, Superintendent of Public Instruction,
Denver, Colo.:

DEAR SIR:—In compliance with the law I desire to give a brief statement regarding the Colorado Institute for Mute and Blind, over whose educational department I have the honor to preside.

The total number of pupils who have been under instruction during the two years is fifty-nine, though some of these were here only for a short time. The average attendance per session has been about forty-five.

General good health has prevailed and the work of the school has been uninterrupted. There has been a slow but gradual increase in the number who avail themselves of the benefits so kindly offered by the State, and we hope that as information concerning the object and scope of the institution becomes more generally diffused, we shall be able to gather into our walls all who need our assistance to become good, useful and self-supporting citizens.

The institution is a part of the public school system of the State, and designs by its special appliances and methods to educate those who could not be reached in the ordinary way. It is of necessity a boarding school, for in no one community of a sparsely settled State could a sufficient number of pupils be gathered to justify the expense of organizing a school.

We endeavor to give those committed to us a fair English education, to instruct them in some useful trade, and so to train them in morals that they may apprehend their duties to their fellow-man and the Supreme Being.

Since our last report a blind department has been organized, and we now have ten pupils who are making creditable progress under their two teachers—one instructing them in the ordinary branches and the other in music. Some of the smaller pupils are becoming quite proficient in kindergarten work.

There are four teachers in the Deaf Mute Department and two in that of the Blind. The salaries of the officers are as follows:

Principal	$1,500
Matron and Acting Superintendent	900
First Teacher, Deaf Mute Department	1,200
Second " " " "	480
Third " " " "	300
First " Blind "	600
Second " " "	400

In conclusion, I desire to request you to emphasize the duty of County Superintendents, or rather the Secretaries of the School Districts, to report all the blind and deaf children in their respective districts between the ages of four and twenty-one years. This, though prescribed by law, has not been done heretofore, and hence we have been unable to lay before the parents of such children the information they so much need. Many of them have no just conception of the institution and its work, but regard it more as an asylum than as a school.

Holding myself in readiness to hand you any information you may desire,

I am, with great respect, yours truly,

D. C. DUDLEY,

Principal.

STATE INDUSTRIAL SCHOOL.

SUMMARY OF THE SECOND BIENNIAL REPORT OF THE STATE INDUSTRIAL SCHOOL, AT GOLDEN, JEFFERSON COUNTY, COLORADO.

The State Industrial School was formally opened July 16, 1881, and has since received 196 pupils—116 of whom were admitted during the past biennial term.

There has been expended during the past two years—

For ordinary expenses	$44,467 90
For building and other extraordinary expenses	29,465 18
Total	$73,933 08

The appropriation made by the General Assembly in 1883 was exhausted in November of the same year, and the hopes of the Board of Control that State certificates of indebtedness could be issued to support the school until a new appropriation should be made, were disappointed. In this dilemma His Excellency Governor James B. Grant was applied to for aid, who, after thoroughly examining into its business, and assuring himself that its business had been well and economically conducted, gave his personal note as collateral security for the sum of $20,000, the amount needed to carry on the school until January, 1885.

When the school numbers one hundred or more pupils in daily attendance, the operating expenses per capita is about 51 cents per day. At the time the appropriation was made, the school had ninety-seven scholars. Expecting that certificates of indebtedness could be issued when the appropriation should be exhausted, the school was kept open, and all boys properly committed were received, until our number in April, 1884, reached 141. When it was decided illegal to issue certificates for the support of the school, it became necessary rapidly to reduce our numbers, active effort was made to find homes for those best fitted for them, and by the end of May following our attendance was reduced to seventy-four—and every boy sent away was provided with a good home, either with his parents or with strangers. The average number of pupils during the whole term has been 120 1-6.

The past biennial term has been one of substantial progress. By the purchase of fifteen acres of land during the past term, our grounds have been increased to twenty acres and enclosed by a neat fence.

Four brick buildings have been erected with appropriation of 1883. Three of these are planned and used for family and school purposes, each are 26x50 feet and two and one-half stories high; in these, properly placed, are boys' and officers' dining-rooms, kitchen, laundry, tailor-shop, three lavatories, four school-rooms, and three dormitories. The whole is arranged for three families of fifty boys each. The first stories are heated by stoves, the second by furnaces specially arranged to heat the third by warm air through registers. The whole is well ventilated by large registers connected with a successful ventilating system. The fourth brick building is 32x32 feet, finished in two stories and basement. The basement is provided with a large oven, and thoroughly fitted up as a bakery. The upper stories are arranged in eight rooms for officers' occupancy.

Two fine shops have been erected—frame buildings completely lined with brick. The larger is our broom factory, and the smaller is divided into shoe and carpenter shops. With lofts, they give floor space of 8960 square feet.

A well-arranged wagon shed, coal and wood shed, barn-yard and boys' closets have also been arranged and built. The main building has been entirely remodeled and the former laundry building fitted with basement, first and second floors, as a storehouse.

The buildings are not designed as permanent school buildings, but finally, when the growing wants of the school demand it, to be used as factory buildings, for which they are specially adapted, and more commodious structures will be erected for the accommodation of the school.

There is now ample room for 175 boys, and with a little crowding 200 could find here a comfortable school.

REPAIRS.

There is economy and education in keeping all buildings well repaired and painted, and the whole premises in the best of order. Want of means has hindered the fully carrying out our wish in this particular, but it has ever been our principle of action, and been carried out as fully as possible.

INDUSTRIAL EDUCATION.

An important part of every true reform work must be its industrial department.

Our boys, as soon as they enter the school, are taught to take an active part in its industries, and very soon become interested in its work. They learn to take pride in the neatness and order of the whole premises; it becomes part of their making, and a daily source of education.

The entire work of the school is performed by the pupils, and each department, or force, is presided over by competent teachers.

The laundry work is entirely done by a force of boys. The work in dining room, kitchen, tailor shop, shoe shop, yards and premises, have to each a force detailed. In the same manner the broom factory, bakery, carpenter, barn, school, dormitory, house and incidental work is divided, and each department or work is felt to be a work of importance.

All clothing worn, including shoes, are made in our own shops, so that everything is had at the least cost, and all becomes part of our educational system.

Our broom factory started under many difficulties, but has proved a real success. One thousand dollars of the profits has been paid over to the Treasurer to help support the school, and nine hundred and seventy-six dollars and eighty-seven cents of surplus earnings remains in the business, with the capital stock intact. Broom making, shoe making, tailoring, baking and carpentering, gives five important trades taught in the school. The products of but one trade have, as yet, been offered in the market. Our brooms have had a ready sale, and we hope to make them indispensable to every Colorado housekeeper.

SCHOOL DEPARTMENT.

Careful attention is given to school instruction. Three and one-quarter hours are given daily in school.

The pupils are carefully graded in five classes, and rapid progress in study has particularly marked almost every scholar.

The following course of study in each class will show what is aimed at:

COURSE OF STUDY.

The E grade comprises the necessary primary instruction in letters and figures for first beginners.

IN THE D GRADE.

Pupils complete the First Reader, numeration and addition, and receive lessons in penmanship, spelling, geography and mental arithmetic.

IN THE C GRADE.

Pupils complete the Second Reader, subtraction, multiplication and short division, receive instruction in penmanship, written and oral spelling, drawing, mental arithmetic, U. S. History and physiology.

IN THE B GRADE.

Pupils complete the Third Reader, long division and common fractions, receive lessons in penmanship, written and oral spelling, drawing, mental arithmetic, physiology, U. S. History and language lessons.

IN THE A GRADE.

Pupils review common fractions and complete arithmetic and take up algebra, receive lessons in penmanship, drawing, written and oral spelling, geography, physiology, bookkeeping and language lessons.

LIBERAL APPROPRIATION NEEDED

To accomplish the greatest good, the necessary wants of the school should be fully if not liberally supplied. The State can hardly afford to have the school again closed against those who should be received, for every boy thus excluded will probably continue to be an offender against the public peace, and a depredator on private rights; but admitted into the school, taught temperance, industry, truth, morality, to respect private and public rights, and the fear of God, given at least a fair common school education, and, as a rule, ninety out of every one hundred, at least, will be returned to society and the State, at the end of their school course, intelligent, industrious citizens, and contributors to its wealth and prosperity.

DISCIPLINE.

The necessity of rapidly reducing our numbers has at times interfered with the regularly established methods of discipline, and to an extent weakened the excellent effect of our badge system; but good order and cheerful obedience has been a most pleasing characteristic of the school, and at very little cost of punishments. Our school has much the method of a well ordered home family. Most of the pupils take pleasure in maintaining the spirit as well as the letter of its rules, and become deeply interested in its good name and work. Many of them have been permitted, unaccompanied by officers, to visit stores in Golden and make purchases for themselves and the school, and a trust has never been betrayed. Their good manners and polite behavior have been a constant subject of remark.

The school, by invitation, has taken part in several public occasions, and has always received praise for correct and soldierly conduct. Permission to visit home has been freely given, and not a single furlough has been violated.

Mrs. Sampson has regularly held a voluntary noonday prayer meeting, which has been well attended, and with marked results for good.

A Band of Hope society has been organized in each family, and is conducted entirely by the boys, they electing their own officers quarterly. Temperance literature is read, speeches, recitations and songs form part of the regular programme, and every Saturday evening a public rehearsal is held in the chapel, interesting alike to visitors, officers and pupils.

The ministers of the various churches in Golden have most kindly given their gratuitous and eloquent services on Sabbath afternoons, making chapel exercises especially interesting and profitable to all.

The Sunday evening "service of song," conducted by Mrs. Sampson, has been very much enjoyed by the boys.

LIBRARY.

Our Legislature, at their last session, appropriated two hundred dollars to form the nucleus of a library. The money has been most carefully spent for books of real value and interest.

Two hundred and sixty volumes, comprising encyclopedias, dictionaries, histories, biographies, books of travel, science, art, and works of standard fiction. In this selection the wants of the smaller as well as the larger boys have been considered and provided for. The books are much read by the pupils of every age, and an additional appropriation would be hailed with delight by the entire school.

GIRLS' DEPARTMENT.

There has been a constant demand during the entire term for the admission of girls, it being claimed that the State should at least show as much care for its girls as it does for its boys. It is hoped it will be possible to at once establish the girls' department of the school.

LONGER TIME NEEDED.

It is regretted that many of the terms of the pupils have been entirely too limited to give the best results. It is desirable that the present limit of commitment be extended to read not less than two nor more than five years. We aim to give every boy sent to our school a good common school education, and in addition, skill in some desirable trade, that he may hereafter become an independent, self-reliant worker.

For this desirable end time should be given to complete the education aimed at, otherwise the incomplete effort may prove a comparative failure.

I desire to tender my sincere thanks to His Excellency Governor James B. Grant, for nobly coming to our help at a most critical time; to the Board of Control for their earnest devotion to the best interests of the school and the welfare of the children committed to its care; to various kind friends for donations of books, magazines and papers; to A. G. Smith, Esq., for the gift of ten dollars for the fourth of July, 1883; to the jubilee singers of our school, under the direction of W. P. Rhodes, Esq., and Mr. James McMullen, for public entertainments, netting the sum of forty dollars, which was donated to the reading fund.

SANITARY CONDITION OF SCHOOL.

GOLDEN, COLO., October 16, 1884.

To the Honorable Board of Commissioners:

I beg leave to submit to your honorable Board the following report concerning the sanitary condition of the State Industrial School, located at Golden, Colorado:

I have made a thorough examination of the premises and each and every department of said school, and found them neat and clean. The ventilation of school rooms and dormitories is fair, the food of uniform good quality and well prepared.

Upon examining the inmates I found no evidence of the diseases which usually prevail in such institutions.

The school has been exceptionally free from all contagious diseases, and excepting a few cases of measles, there has been no disease of an epidemic character. I think the location of the school and the arrangement of the buildings render it one of the most healthy.

Yours most respectfully,

JOHN P. KELLY, M. D.

LETTER FROM REV. C. M. JONES.

DENVER, COLO., November 7, 1884.

It is three years since Superintendent Sampson requested the pastors of Golden to preach at the Sunday afternoon services which he holds at the Industrial School. In this way once each month I have gone to address these boys, and it has proved one of the most pleasant experiences of my life. I have never known so satisfactory an audience. The presumption would not seem to be in favor of much encouragement in moral and religious work among boys whose homes and haunts had been so frequently so demoralizing and depraving. And undoubtedly such pastoral service as ours would have proved utterly unavailing had not the boys been in such a school and under the daily influence of Superintendent and Mrs. Sampson.

In sympathy with their magnificent spirit we have labored to supplement and emphasize their moral and religious teaching. Catching something of their noble enthusiasm, we have endeavored to exalt the idea of a true manhood We assume, as without question, that these boys are going to make men of themselves, and we draw upon every motive and means by which they may be induced to appreciate the worthiness and real glory and sure satisfaction of such a career. We preach a gospel of cheer, and strength and magnanimity. Religion we urge as a preparation for a true human life.

This is the spirit in which, during these three years, I have spoken in these Sabbath discourses, and I believe I am also speaking for my brother pastors, as to their spirit and purpose. The Christian young men who have gone from this school will average, I believe, better for well founded principles and genuine religious purpose, than the same number from any other kind of school. They are to be found, some of them in distant States, devoted and true Christians and promising men.

Very cordially submitted,

CHAS. M. JONES,

Pastor Golden Baptist Church.

As the school has printed a full report of its work for the past biennial term, it is thought unnecessary to put the State to the further expense of reproducing it in that of the Superintendent of Public Instruction. The State Superintendent desiring that the important work of our school should be known as widely as possible, invited this condensed summary of its work for the past biennial term.

Those wishing a full report of the school will please send their address on a postal card to the Superintendent at Golden, Colorado.

WM. C. SAMPSON,
Superintendent.

R. B. SAMPSON,
Matron.

J. F. GARDNER,
Frankstown,

W. B. OSBORN,
Loveland,

W. G. SMITH,
Golden,
Board of Control.

TABLE I.

County Superintendents of Schools.

Term expires January, 1886

COUNTY.	NAME	POST-OFFICE.
Arapahoe	John L. Ferzer	Denver
Bent	John A Murphy	West Las Animas
Boulder	A L Gravelle	Boulder.
Chaffee	John G Hollenbeck	Salida
Clear Creek	Henry Bowman	Idaho Springs.
Conejos	R. K. Brown	Conejos.
Costilla	William Stewart	Ft Garland.
Custer	Artemus Walters	Silver Cliff
Delta	George H. Merchant	Delta.
Dolores	O H. Taylor	Rico
Douglas	William B. Evans	Larkspur.
Eagle	L. S. Pierce	Taylor.
Elbert	S. J. Stid	Elbert.
El Paso	Rev. B A P. Eaton	Colorado Springs
Fremont	Z. T Hill	Canon City.
Garfield	M V B Blood	Glenwood Springs
Gilpin	H. M Hale	Central City.
Grand	Everett M. Harmon	Grand Lake.
Gunnison	Geo. B. Spratt	Gunnison.
Hinsdale	John M. Finley	Lake City.
Huerfano	A H Quillian	Walsenburg.
Jefferson	W. G. Smith	Golden
Lake	E. T. Taylor.	Leadville.
La Plata	D Preston Bell	Pine River
Larimer	Rev. W. H. McCreery	Ft Collins.
Las Animas	John W. Douthit	Trinidad.
Mesa	George Caldwell	Grand Junction
Montrose	Dr W W Ashley	Montrose.
Ouray	P H Shue	Ouray
Park	Wm L. Bailey, Jr	Fairplay.
Pitkin	H. L Harding	Aspen
Pueblo	Dr. A Y. Hull	Pueblo.
Rio Grande.	Sigel Heilman	Del Norte.
Routt	J. H Cheney	Yampa
Saguache	W. E White	Saguache
San Juan	Dr R H. Brown	Silverton
San Miguel	H. C Lay, Jr	Telluride
Summit	Dr. B A Arbogast	Breckenridge.
Weld	Rev A. K. Packard	Greeley.

TABLE II.

Examination of Teachers.

COUNTIES	1883. Certificates Given							1884. Certificates Given						
	First Grade.		Second Grade.		Third Grade.			First Grade		Second Grade		Third Grade		
	Male.	Female.	Male.	Female.	Male.	Female	Total	Male	Female	Male.	Female.	Male.	Female	Total
Arapahoe	7	21	4	24	3	22	81	9	14	7	35	4	20	89
Bent		2	4	2	1	2	11	3	3	2	3	1	1	13
Boulder	4	18	5	17	8	20	72	1	6	1	14	9	17	48
Chaffee	1	8	2	2			13	9	13	1	13			36
Clear Creek	2	3	1	1	1	5	13	4	2	2	5	1	2	16
Conejos	2	2	6	5	5	4	24		1	1		9	8	19
Costilla	1		2	2	5		10	1	1	2	2	5		11
Custer	4	1	1	1	1	8	16	2	4	3	8	1	9	27
Delta	1				1	1	3	2	1		1	1	1	6
Dolores		1			1		2	1		1				2
Douglas	1	2	5	5		6	19	2	3	4	7	1	7	24
Eagle				1		1	2	1			4			5
Elbert	2		1	5		5	13		1	1	5	1	4	12
El Paso	5	9	2	10	3	3	32	4	8	3	11	4	6	36
Fremont	7	5	5	3	2	2	24	10	13		6	3	5	37
Garfield													1	1
Gilpin	2	9		9		2	22	1	4	3	13	1	7	29
Grand			1	1		1	3			1	1	2	2	6
Gunnison	3	11	4	21	5	12	56		5		2	1		8
Hinsdale	1	1	1	3	1		7	2			2			4
Huerfano		1	1	2	2	4	10	2	2	3	2	3	2	14
Jefferson	6	6	4	6	6	7	25	5	4	3	8	7	9	36
Lake	1	21	1	21		17	61	1	12		6		5	24
La Plata		2		7		1	10	4	2	3	7		1	17
Larimer	2	7	5	16	4	35	69	1		5	20	2	23	51
Las Animas	2	2	2	6	8	4	24	3	2		10	2	6	23
Mesa		2		2			4				1			1
Montrose				1			1	3			2	2		7
Ouray	1	1			2	1	5	4	1	4	6	1	2	18
Park	1	2		6	1	7	17		3	3	1	1	14	22
Pitkin										1			1	2
Pueblo	3	20	4	21		5	53	1	25	4	15	3	6	54
Rio Grande	1				1	8	10			1	6	1	8	16
Routt				2			2	1			2		2	5
Saguache	3	4	1	2		5	15	3		1	2	1	6	13
San Juan		1		1			2						2	2
San Miguel						2	2		1				1	2
Summit	2	5		2			9	1	2	2	6		1	12
Weld	3	7	10	19	2	11	52	3	6	13	21	9	25	77
Total	68	173	72	227	63	201	804	84	139	75	247	76	204	825

TABLE III.

COUNTIES.	CENSUS—1883								
	BETWEEN 6 AND 16			BETWEEN 16 AND 21			TOTAL BET. 6 & 21.		
	Male.	Female.	Total.	Male.	Female.	Total.	Male.	Female.	Total.
Arapahoe	5177	5404	10581	1578	1532	3110	6755	6936	13691
Bent	165	190	355	51	43	94	216	233	449
Boulder	1217	1198	2415	387	356	743	1604	1554	3158
Chaffee	669	641	1310	261	234	495	930	875	1805
Clear Creek	693	677	1370	187	154	341	880	831	1711
Conejos	498	484	982	197	138	335	695	622	1317
*Costilla	386	343	729	110	65	175	496	408	904
Custer	529	540	1069	154	152	306	683	692	1375
Delta	55	58	113	63	67	130	118	125	243
Dolores	33	19	52	7	8	15	40	27	67
Douglas	235	268	503	59	54	113	294	322	616
Eagle	63	72	135	11	8	19	74	80	154
Elbert	134	131	265	43	32	75	177	163	340
El Paso	721	767	1488	259	194	453	980	961	1941
Fremont	706	624	1330	154	176	330	860	800	1660
Garfield	...	...		...	...	...	...	...	...
Gilpin	648	630	1278	184	147	331	832	777	1609
Grand	102	90	192	20	22	42	122	112	234
Gunnison	470	390	860	104	100	204	574	490	1064
Hinsdale	103	87	190	21	19	40	124	106	230
Huerfano	674	688	1362	245	230	475	919	918	1837
Jefferson	714	1075	1789	206	108	364	920	1233	2153
Lake	1078	1197	2275	260	222	482	1338	1419	2757
La Plata	386	293	679	86	59	145	472	352	824
Larimer	792	751	1543	211	184	395	1003	935	1938
Las Animas	1278	1167	2445	381	267	648	1659	1434	3093
Mesa	106	96	202	22	22	44	128	118	246
Montrose	58	40	98	12	8	20	70	48	118
Ouray	102	98	200	38	38	76	140	136	276
Park	238	281	519	84	53	137	322	334	656
Pitkin	48	43	91	12	6	18	60	46	109
Pueblo	945	1212	2157	307	317	624	1252	1529	2781
Rio Grande	223	161	384	48	38	86	271	199	470
Routt	41	22	63	12	8	20	53	30	83
Saguache	326	287	613	92	70	162	418	357	775
San Juan	59	69	128	16	13	29	75	82	157
San Miguel	47	35	82	13	14	27	60	49	109
Summmit	117	145	262	33	34	67	150	179	329
Weld	829	832	1661	276	210	486	1105	1042	2147
Total	20665	21105	41770	6204	5452	11656	26869	26557	5342

*Estimated. No report.

TABLE III.—*Concluded.*

COUNTIES	CENSUS—1884.								
	BETWEEN 6 AND 16			BETWEEN 16 & 21.			TOTAL BET. 6 & 21.		
	Male.	Female	Total.	Male.	Female.	Total.	Male	Female.	Total.
Arapahoe.	5496	6025	11521	1823	1802	3625	7319	7827	15146
Bent	184	222	406	73	50	123	257	272	529
Boulder	1223	1185	2408	366	373	739	1589	1558	3147
Chaffee.	685	603	1288	210	208	418	895	811	1706
Clear Creek	660	671	1331	193	176	369	853	847	1700
Conejos.	627	620	1247	176	164	340	803	784	1587
Costilla	290	262	552	447	165	412	537	427	964
Custer	443	497	940	128	121	249	571	618	1189
Delta.	96	89	185	19	22	41	115	111	226
Dolores	27	21	48	12	11	23	39	32	71
Douglas	251	266	517	80	58	138	331	324	655
Eagle	60	61	121	20	11	31	80	72	152
Elbert	149	123	272	53	30	83	202	153	355
El Paso	769	808	1577	218	245	463	987	1053	2040
Fremont	609	589	1198	283	332	615	892	921	1813
Garfield	32	17	49	11	9	20	43	26	69
Gilpin	615	589	1204	206	167	373	821	756	1577
Grand	89	72	161	21	16	37	110	88	198
Gunnison	409	435	844	138	135	273	546	571	1117
Hinsdale	79	82	161	13	8	21	92	90	182
Huerfano	731	734	1465	262	235	497	993	969	1962
Jefferson	764	737	1501	255	180	435	1019	917	1936
Lake	1179	978	2157	214	195	409	1391	1173	2566
La Plata	364	341	705	106	98	204	490	419	909
Larimer	792	745	1537	258	213	471	1050	958	2008
Las Animas	1261	1169	2430	374	308	682	1635	1477	3112
Mesa	148	129	277	34	22	56	182	151	333
Montrose	106	81	187	24	17	41	130	98	228
Ouray	104	112	216	43	37	80	147	149	296
Park	294	301	597	94	71	165	388	374	762
Pitkin	77	61	138	20	20	40	97	81	178
Pueblo	1135	1196	2331	337	283	620	1472	1479	2951
Rio Grande	274	233	507	79	64	143	343	307	650
Routt	31	41	72	16	5	21	47	46	93
Saguache	294	285	579	87	51	138	381	336	717
San Juan	54	53	107	32	20	52	86	73	159
San Miguel.	42	25	67	13	13	26	55	38	93
Summit	151	191	342	35	50	85	186	241	427
Weld	950	936	1886	307	246	553	1257	1182	2439
Total.	21564	21567	43131	7080	6031	13111	28433	27809	56242

TABLE IV.

Enrollment and Atten

COUNTIES	PUPILS—1883.						PERCENTAGES.		
	Enrolled in Graded Schools.	Enrolled in Ungraded Schools	Under 16 enrolled in Public Schools	Over 16 enrolled in Public Schools.	Total Enrollment	Average daily attendance.	Enrollment on whole number.	Daily attendance on Enrollment.	County tax levy—mills
Arapahoe	8101	755	8567	289	8856	5591	64	63	3
Bent	128	234	344	18	262	192	58	73	13
Boulder	1005	1454	2297	162	2459	1681	78	68	3
Chaffee	601	526	1025	102	1127	483	62	43	5
Clear Creek	810	479	1203	86	1289	809	75	63	2½
Conejos	184	727	743	168	911	535	69	59	5
Costilla		370	312	58	370	231	41	62	2
Custer	435	391	775	51	826	553	60	67	5
Delta	. .	61	60	1	61	34	25	55	5
Dolores	. .	57	55	2	57	37	85	65	2
Douglas	. .	517	481	36	517	301	83	57	3
Eagle		74	69	5	74	49	51	66	2
Elbert	. . .	263	246	17	263	159	77	60	3
El Paso	897	815	1486	226	1712	1042	88	60	2
Fremont	362	880	1133	109	1242	863	75	70	5
Garfield	. . .	. .	. .	.	. . .	. . .		. . .	. .
Gilpin	971	207	1132	46	1178	806	73	68	2
Grand	. . .	114	109	5	114	86	49	75	2
Gunnison	463	351	771	46	817	516	77	63	3
Hinsdale	134	38	149	23	172	97	75	56	5
Huerfano		723	532	191	723	524	39	72	3½
Jefferson	560	863	1280	143	1423	945	66	66	3
Lake	1819	289	1731	377	2108	172	76	81	2
La Plata	351	315	586	80	666	281	81	62	3½
Larimer	660	685	1287	58	1345	877	69	65	4
Las Animas	808	858	1273	393	1666	827	54	49	2
Mesa	.	54	48	6	54	41	22	76	2
Montrose	.	33	33	. . .	33	14	28	42	2
Ouray		131	116	15	131	79	47	60	2½
Park	104	418	466	56	522	338	79	64	2
Pitkin	. .	75	74	1	75	52	68	69	2
Pueblo	1780	463	2066	177	2243	1268	81	56	2½
Rio Grande	258	183	317	124	441	270	94	61	2
Routt	. .	80	60	20	80	25	96	31	2
Saguache	.	471	350	121	471	289	61	61	2
San Juan	.	75	70	5	75	70	48	93	3
San Miguel	. . .	48	48	.	48	22	44	45	5
Summit	. .	246	188	58	246	163	78	66	3
Weld	499	1188	1548	139	1687	1137	78	67	3
Total	20930	15514	33030	3414	36444	23008	68	63	

TABLE IV.—*Concluded.*

Enrollment and Attendance.

COUNTIES	PUPILS—1884.								PERCENTAG'S		
	Enrolled in Graded Schools.	Enrolled in Ungraded Schools.	Under 16 enrolled in Public Schools	Over 16 enrolled in Public Schools.	Whole No enrolled in Public Schools			Average daily attendance	Enrollment on whole number	Daily attendance on enrollment	County, tax levy—mills.
					Male.	Female	Total				
Arapahoe	9011	483	8848	646	4613	4881	9494	6126	63	65	3
Bent	104	258	327	35	170	191	362	221	68	61	2
Boulder	1114	1356	2322	148	1258	1212	2470	1642	78	66	3
Chaffee	698	380	1003	75	548	530	1078	698	67	65	4
Clear Creek	389	738	1071	56	572	555	1127	726	66	64	2½
Conejos	200	800	855	145	561	439	1000	467	63	47	2
Costilla		427	349	78	270	157	427	239	44	56	2
Custer	490	349	787	52	399	440	839	427	71	51	2
Delta		152	129	23	83	69	152	87	69	57	4
Dolores		43	37	6	23	20	43	39	61	91	2
Douglas		477	435	42	242	235	477	253	72	53	3
Eagle		83	81	2	46	37	83	50	55	60	2
Elbert		250	223	27	136	114	250	157	70	63	3
El Paso	802	696	1229	269	756	742	1498	907	73	61	2
Fremont	349	1017	1276	90	670	696	1366	916	75	67	4
Garfield		24	17	7	15	9	24	15	35	62	2
Gilpin	975	185	1108	52	590	570	1160	717	74	62	2
Grand		71	68	3	36	35	71	44	36	62	2
Gunnison	497	391	823	65	447	441	888	569	79	64	2
Hinsdale	112	19	129	2	69	62	131	111	72	85	5
Huerfano		794	643	151	419	375	794	524	40	66	3½
Jefferson	581	900	1380	101	754	727	1481	937	77	63	3
Lake	1712	249	1890	71	1001	960	1961	1088	76	55	5
La Plata	348	274	553	69	359	263	622	353	68	56	3.7
Larimer	686	811	1400	97	763	734	1497	859	74	57	4
Las Animas	791	759	1388	162	882	668	1550	868	49	56	2
Mesa		168	164	4	96	72	168	98	50	58	5
Montrose		143	133	10	86	57	143	68	62	47	2
Ouray	100	82	151	31	106	76	182	135	61	74	2
Park	78	405	441	4	260	224	484	346	63	71	2
Pitkin		103	99	4	56	47	103	66	58	64	2
Pueblo	1953	601	2331	223	1254	1300	2554	1529	86	59	3
Rio Grande	258	176	400	34	246	188	434	246	67	56	5
Routt		54	44	10	21	33	54	41	58	76	2
Saguache	133	377	415	55	249	221	470	270	65	57	2
San Juan		85	76	9	46	39	85	57	54	67	3
San Miguel		49	44	5	28	21	49	30	53	61	2
Summit	221	191	375	37	180	232	412	186	97	45	3
Weld	529	1320	1686	163	954	895	1849	1195	76	64	3
Total	22121	15741	34730	3142	20264	17568	37832	23307	67	62	

TABLE V.

Number of Teachers in Graded and Ungraded Schools, and Average Monthly Salaries.

COUNTIES.	1883.									
	GRADED SCHOOLS					UNGRADED SCHOOLS				
	Teachers			Salaries		Teachers			Salaries	
	Male.	Female	Total.	Male	Female	Male.	Female.	Total.	Male.	Female
Arapahoe	9	119	128	$118 00	$58 00	21	17	38	$54 00	$48 00
Bent	1	1	2	120 00	75 00	5	7	12	60 00	52 50
Boulder	2	15	17	138 88	61 70	21	43	64	57 14	42 11
Chaffee	2	8	10	75 00	65 00	7	15	22	60 30	46 60
Clear Creek	4	9	13	112 34	80 00	1	16	17	60 00	49 00
Conejos	1	3	4	120 00	73 00	10	13	23	61 80	44 37
Costilla						9	3	12	25 66	33 86
Custer	2	4	6	100 00	60 00	8	7	15	43 75	41 00
Delta							3	3		47 66
Dolores							1	1		80 00
Douglas						9	18	27	45 00	42 00
Eagle						1	4	5	60 00	53 00
Elbert						7	11	18	45 00	46 75
El Paso	1	12	13	130 00	67 81	7	26	33	46 42	43 35
Fremont	1	8	9	100 00	57 50	13	12	25	57 23	42 08
Garfield										
Gilpin	3	11	14	108 33	84 09	4	10	14	55 75	56 30
Grand						2	5	7	45 00	44 00
Gunnison	2	8	10	117 50	71 50	3	10	13	57 50	57 67
Hinsdale	1	1	2	100 00	80 00	1	3	4	50 00	50 00
Huerfano						12	15	27	45 00	47 75
Jefferson	2	7	9	105 00	66 00	13	18	31	55 00	44 00
Lake	3	26	29	137 00	80 00		7	7		56 25
La Plata	2	3	5	95 00	75 00	2	9	11	55 00	54 44
Larimer	2	9	11	97 50	60 00	9	38	47	41 25	39 21
Las Animas	4	10	14	90 00	64 00	21	8	29	44 60	41 00
Mesa							1	1		50 00
Montrose							1	1		50 00
Ouray						3	1	4	61 67	60 00
Park	1	1	2	80 00	55 00	4	20	24	60 00	40 00
Pitkin							2	2		104 28
Pueblo	5	32	37	130 00	65 00	8	30	38	48 21	49 66
Rio Grande	2	2	4	100 00	75 00	2	6	8	62 50	48 75
Routt						2	2	4	45 00	50 00
Saguache						5	11	16	53 33	47 90
San Juan							2	2		79 44
San Miguel							2	2		57 50
Summit						3	7	10	47 50	53 75
Weld	1	8	9	133 33	61 00	20	50	70	45 85	43 23

TABLE V.—*Concluded.*

COUNTIES.	1884									
	GRADED SCHOOLS					UNGRADED SCHOOLS				
	Teachers			Salaries		Teachers.			Salaries	
	Male	Female	Total	Male.	Female	Male.	Female	Total.	Male	Female
Arapahoe	14	136	150	$105 55	$59 91	10	17	27	$48 05	$48 23
Bent	1	1	2	100 00	75 00	7	8	15	61 40	53 00
Boulder	5	14	19	110 00	72 38	17	45	62	53 53	43 37
Chaffee	3	15	18	78 33	60 00	7	14	21	59 28	46 44
Clear Creek	2	6	8	150 00	77 50	7	15	22	67 85	42 77
Conejos	1	5	6	166 67	72 96	15	16	31	50 78	48 37
Costilla						10	4	14	41 16	45 00
Custer	2	9	11	103 33	56 82	9	10	19	40 93	38 83
Delta						4	2	6	61 67	40 00
Dolores						1	1	2	90 00	90 00
Douglas						12	18	30	47 50	42 38
Eagle						1	5	6	60 00	65 71
Elbert						6	13	19	57 25	46 85
El Paso	1	12	13	157 50	70 00	9	22	31	67 50	40 00
Fremont	2	9	11	110 00	55 56	11	17	28	56 81	45 42
Garfield							1	1		50 00
Gilpin	6	16	22	107 00	73 37	3	6	9	56 00	45 00
Grand						4	3	7	45 00	46 67
Gunnison	2	10	12	107 50	65 53	4	15	19	53 33	58 06
Hinsdale	1	2	3	100 00	80 00	1	1	2	50 00	50 00
Huerfano						17	11	28	46 73	45 45
Jefferson	2	9	11	107 50	69 00	16	20	36	46 00	42 63
Lake	1	26	27	120 00	95 00	1	9	10	60 00	55 00
La Plata	2	5	7	92 50	70 00	3	11	14	65 00	50 00
Larimer	2	12	14	97 50	57 81	12	43	55	39 50	40 23
Las Animas	4	10	14	91 25	66 00	17	11	28	48 00	40 00
Mesa						1	6	7	50 00	54 20
Montrose						5	2	7	61 00	50 00
Ouray	1	2	3	100 00	75 00	4	1	5	50 00	33 34
Park	1	1	2	100 00	55 00	5	12	17	39 33	48 43
Pitkin						1	1	2	110 00	85 00
Pueblo	7	28	35	117 87	70 26	4	24	28	46 84	48 60
Rio Grande	3	2	5	123 33	75 00	3	7	10	49 54	43 74
Routt						4	1	5	50 00	50 00
Saguache	1	1	2	80 00	50 00	10	10	20	59 00	44 00
San Juan							3	3		82 00
San Miguel							2	2		65 00
Summit		2	2		60 00	2	4	6	52 50	55 00
Weld	1	13	14	166 66	66 56	20	41	61	48 86	45 23

TABLE VI.

Districts, School Houses and Tuition.

COUNTIES	1883.						
		No. of days of School.		School Houses.			
	Districts.	Graded Schools	Ungraded Schools.	Number.	Valuation.	Sittings.	Volumes in Library
Arapahoe	29	190	140	45	$707,950	6,925	2,180
Bent	11	200	151	8	9,925	231	
Boulder	47	183	107	40	65,150	2,352	50
Chaffee	20	167	104	13	32,227	819	...
Clear Creek	11	184	105	10	34,893	989	350
Conejos	12	195	122	10	17,760	535	...
*Costilla	9	...	125	4	680	235	52
Custer	20	166	87	14	8,025	809	180
Delta	3	.	65	3	100	...	...
Dolores	1	...	66	1	2,068	56	...
Douglas	21	...	116	17	9,325	522	...
Eagle	3	...	98	1	1,000	46	...
Elbert	11	...	159	11	5,725	300	...
El Paso	28	180	99	28	48,050	1,408	800
Fremont	20	195	124	19	34,690	1,032	58
Garfield	...	...	...	...	...	...	...
Gilpin	8	180	88	8	48,760	873	1,676
Grand	7	...	86	1	300	40	...
Gunnison	16	172	87	13	43,150	1,082	...
Hinsdale	3	200	91	1	28,000	132	...
Huerfano	20	...	98	9	2,110	349	...
Jefferson	32	190	109	32	34,400	1,488	150
Lake	8	135	81	11	90,000	2,000	...
La Plata	15	160	102	12	18,025	717	...
Larimer	31	191	101	27	35,075	1,304	300
Las Animas	28	197	77	13	23,800	550	...
Mesa	1	...	100	...	...	...	...
Montrose	2	...	60	1	50	...	...
Ouray	3	...	99	3	1,525	118	...
Park	17	200	160	16	4,025	601	...
Pitkin	2	...	145	3	4,500	70	...
Pueblo	33	185	92	27	145,630	1,922	...
Rio Grande	7	165	78	7	13,507	400	...
Routt	6		44	1	50	25	...
Saguache	15	...	95	10	5,640	375	...
San Juan	2	...	140	1	4,000	50	...
San Miguel	1	...	64	...	...	...	...
Summit	9	...	76	4	6,000	300	...
Weld	42	178	130	35	85,523	1,724	300
Total	552	183	102	459	$1,551,080	30,434	6,096

*From report for 1882. No report for 1883.

TABLE VI—*Concluded.*

COUNTIES.	1884.								
		No of days of School.		School Houses.				Av cost per month for each pupil.	
	Districts	Graded Schools	Ungraded Schools	Number.	Valuation	Sittings.	Volumes in Library.	By enrollment.	By av attendance.
Arapahoe	31	184	136	47	$640,000	6,311	2,300	$2 76	$3 90
Bent	11	200	137	8	18,025	693	. . .	4 44	6 52
Boulder	46	180	112	41	67,230	2,576	420	2 34	3 77
Chaffee	22	176	103	14	37,750	1,248	6	3 12	5 04
Clear Creek	13	200	110	10	21,100	1,047	150	1 76	2 69
Conejos	16	180	92	11	18,721	598	50	1 98	3 68
Costilla	11	. . .	91	6	2,400	400	. .	1 55	2 64
Custer	19	186	96	17	10,520	928	34	2 51	4 35
Delta	8	. . .	110	4	940	52	. . .	1 56	3 16
Dolores	1	. . .	140	1	1,800	120	. . .	2 81	3 10
Douglas	21	. .	110	19	12,300	534	. . .	2 71	4 71
Eagle	4	. .	123	1	1,100	52	. .	3 24	5 68
Elbert	11		153	13	10,300	347	.	4 85	8 18
El Paso	28	190	115	31	64,755	1,665	600	2 92	4 77
Fremont	19	160	113	21	44,900	1,273	58	2 23	3 34
Garfield	3	.	60	.	. . . . .	. .	. . .	3 00	4 15
Gilpin	8	200	94	9	45,025	961	1768	1 86	3 01
Grand	9	.	54	3	637	150	. .	4 11	6 65
Gunnison	17	200	77	16	19,700	1,208	. .	6 07	9 21
Hinsdale	3	160	80	2	30,500	166	.	4 26	4 65
Huerfano	23	. .	93	13	3,246	530	. .	2 21	3 27
Jefferson	33	175	117	36	40,835	1,679	174	2 59	4 24
Lake	8	180	70	11	150,980	1,770	50	1 19	2 93
La Plata	15	173	86	15	15 310	609	. .	3 04	4 74
Larimer	35	184	110	32	42,450	1,475	300	2 58	4 19
Las Animas	30	133	95	15	33,580	600	. . .	1 72	2 88
Mesa	7	.	88	1	8,500	250	. .	3 87	5 21
Montrose	6	.	85	1	8,000	200	.	2 80	5 00
Ouray	6	100	70	4	10,450	264	. . .	3 18	5 27
Park	19	195	103	16	13,930	449	. .	2 65	4 42
Pitkin	2		80	2	4,650	150	.	2 06	3 22
Pueblo	32	190	91	32	157 390	1,843	452	2 82	4 78
Rio Grande	9	163	104	9	13,600	438	. .	3 84	7 72
Routt	6	. . .	68	5	230	42	. . .	5 23	6 88
Saguache	14	160	92	11	9,145	370	. .	2 76	4 69
San Juan	2	. .	100	1	2,500	85	. .	3 72	5 62
San Miguel	2	. .	128	1	4,000	48	. .	1 31	2 10
Summit	7	100	68	7	9,657	291	. . .	2 06	4 56
Weld	47	180	145	39	100,000	2,150	375	2 46	3 90
Total	604	174	100	525	$1,676,130	35,662	6,687	$2 58	$4 19

TABLE VII.

Financial Statement for 1883.

COUNTIES	RECEIPTS.					
	Amount on hand Sept. 1, 1882	From General Fund	From Special Fund.	From Building Fund.	From all other sources	Total Receipts.
Arapahoe	18954 59	108395 30	127390 99		89857 92	344598 80
Bent	4402 53	68 9 34	2070 84		431 94	13714 65
Boulder	15708 37	14767 16	15849 68	2904 46	691 95	49921 62
Chaffee	5376 72	10971 00	5107 83	285 19	1007 23	22747 97
Clear Creek	2495 44	8107 54	7295 22	1193 14	1939 84	21031 18
Conejos	1717 18	6794 88	3069 28	3570 00	179 42	15330 76
*Costilla	1244 64	2512 82	1441 23		180 68	5379 37
Custer	644 39	6362 16	2285 34	120 08	522 19	9934 16
Delta	556 91				9 00	565 91
Dolores	123 97	701 72	643 90			1469 59
Douglas	3772 26	3635 45	1760 06	1086 94	639 34	10894 05
Eagle		590 02	18 00		329 77	943 79
Elbert	4642 39	4076 34	171 93		545 92	9436 57
El Paso	5926 31	10602 88	12465 84	173 76	98 41	29267 20
Fremont	2374 36	6540 41	7757 08	443 56	5838 86	22954 27
Garfield			No organization.			
Gilpin	663 36	4747 66	1674 34		10145 50	17230 86
Grand	227 00	773 97				1000 97
Gunnison		6780 34	14651 51		1195 65	22627 50
Hinsdale	1470 27	3030 38	3833 67		135 30	8469 67
Huerfano	2298 00	5027 90	604 86	99 58	591 73	8622 07
Jefferson	3680 80	9993 45	7936 48	1371 15	5880 89	28862 77
Lake	1663 74	30772 92				32436 66
La Plata	695 65	6074 53	2330 17	1798 97	1305 24	12204 56
Larimer	3167 98	11312 78	10799 46	925 51	6877 23	33082 96
Las Animas	7825 12	8281 14	5433 93	9518 74	1411 17	32470 10
Mesa		344 18				344 18
Montrose		150 00				150 00
Ouray	77 86	834 95	1723 90		8706 50	11343 21
Park	2002 96	3156 38	3742 71		691 80	9593 85
Pitkin	31 17	289 80	399 83		2042 96	2763 76
Pueblo	20843 40	19899 71	19318 93	6761 36	54494 73	121318 13
Rio Grande	2679 19	1655 57	3570 56	255 60	1250 35	9411 27
Routt		161 00				161 00
Saguache	1289 16	2977 85	1861 75	1000 00		7128 76
San Juan	765 55	1179 89				1945 44
San Miguel	193 08	25 00	275 00			493 08
Summit	441 68	2070 76	521 54	5500 00	621 92	9155 90
Weld	10283 20	18995 06	3436 13	821 33	29376 82	63112 54
Total	$128239 23	$329408 23	$269141 99	$37829 37	$227200 26	$992119 08

*Estimated No report.

TABLE VII.—*Concluded.*

Financial Statement for 1883.

COUNTIES.	EXPENDITURES.					Bal. in hands of Co (& Dist) Treas to credit of District Aug 31, 1883
	For Teachers' Wages	For Current Expenses	For Sites, Buildings, Furniture, etc.	For Temporary Loans Paid	Total Expenditures.	
Arapahoe	102558 27	29318 76	150028 01	26490 56	308395 60	36203 20
Bent	5757 75	1100 63	2580 55	3 00	9441 93	4272 72
Boulder	21478 00	3800 38	12620 04	5525 51	43423 93	6497 69
Chaffee	10347 66	3171 27	2892 82	180 99	16552 74	6195 23
Clear Creek	11357 37	3228 73	2396 86	143 91	17126 87	3904 31
Conejos	6130 70	2171 14	4490 29	80 80	12872 93	2457 83
*Costilla	1762 93	389 75	250 27	. .	2402 97	2976 40
Custer	6730 15	1431 95	352 88	97 23	8612 21	1321 95
Delta	413 50	. . .	.	95 71	509 21	56 70
Dolores	300 00	107 15	267 95	. .	675 10	794 49
Douglas	5030 79	323 62	436 85	542 60	6333 86	4560 19
Eagle	713 30	37 10	. .	.	750 40	193 39
Elbert	4120 25	693 42	. . .	. .	4813 67	4622 90
El Paso	15761 50	3275 37	3875 76	981 73	23894 36	5372 84
Fremont	9846 15	2325 50	7364 74	1667 85	21204 24	1750 03
Garfield	. .	. .	. . . .	. . .	. . .	. . .
Gilpin	12224 95	4209 46	378 37	5 86	16818 64	412 22
Grand	310 00	285 00	206 53	.	801 53	199 44
Gunnison	14954 88	4334 77	694 93	. . .	19984 58	2642 92
Hinsdale	2460 00	2944 59	. .	1332 15	6736 74	1732 88
Huerfano	5258 96	452 67	207 20	60 90	5979 73	2642 34
Jefferson	13843 49	3124 63	5153 85	3040 36	25162 33	3700 44
Lake	17573 00	13801 76	. . . . .	. . .	31374 76	1061 90
La Plata	6480 71	1258 63	280 65	3093 67	11113 66	1090 90
Larimer	12085 62	3719 08	6485 31	5291 23	27581 24	5501 72
Las Animas	11481 12	2561 35	7255 67	1346 06	22644 20	9825 90
Mesa	250 00	50 00	. . .	. . . .	300 00	44 18
Montrose	150 00	. . .	.	. . .	150 00	. .
Ouray	1338 75	326 40	3073 65	5569 95	10308 75	1034 46
Park	4543 19	541 40	647 49	. . . .	5732 08	3861 77
Pitkin	1460 00	868 50	428 46	. .	2756 96	6 80
Pueblo	30117 44	17853 29	22745 53	39606 66	110322 92	10995 21
Rio Grande	4552 04	1207 23	2044 26	. . . . .	7803 53	1607 74
Routt	150 00		. .	. . .	150 00	11 00
Saguache	3699 72	701 12	1047 00	609 28	6057 12	1071 64
San Juan	800 00	128 75	253 55	162 24	1344 54	600 90
San Miguel	225 00	65 08	. . .	. . .	290 08	203 00
Summit	1673 33	152 43	5597 91	475 00	7898 67	1257 23
Weld	19415 35	7233 31	23593 41	311 22	50553 29	12559 25
Total	$367355 89	$117104 22	$267610 79	$96714 47	$848875 37	$143243 71

*Estimated No report

TABLE VIII.

Financial Statement for 1884.

COUNTIES.	RECEIPTS.					
	Amount on hand September 1, 1883	From General Fund	From Special Fund.	From Building Fund.	From all other sources	Total Receipts
Arapahoe	37843 96	110467 53	56778 26	131366 81	42688 26	379144 82
Bent	4272 72	7504 67	1372 27	5461 38	396 24	19007 28
Boulder	6016 06	15322 66	11219 60	5610 32	1420 65	39589 37
Chaffee	6097 23	9283 51	4826 20	2843 73	118 00	23168 67
Clear Creek	1707 20	6981 08	10391 00	1200 00	3121 60	23400 88
Conejos	3089 11	7388 70	4097 56	1399 97	643 90	16619 24
Costilla	2806 53	1826 85	. . .	233 65	26 20	4893 23
Custer	1727 00	6580 99	3764 54	142 49	225 43	12440 45
Delta	. . .	1813 33	493 85	. . .	296 00	2603 18
Dolores	141 19	860 63	845 79	492 33	39 29	2379 41
Douglas	3544 45	4064 01	1745 78	1091 20	901 83	11347 27
Eagle	193 39	626 53	1086 88	532 54	. . .	2439 34
Elbert	5076 87	5167 74	326 96	27 83	247 15	10846 55
El Paso	5395 85	10196 40	13342 83	2401 28	75 86	31412 22
Fremont	1691 26	9431 27	8561 21	2045 34	2089 23	23818 31
Garfield	. . .	242 12	. . .	. . .	. .	212 12
Gilpin	458 76	5561 20	12646 06	. . .	102 55	18768 57
Grand	77 50	1725 00	7 00	. . .	106 57	1916 07
Gunnison	3259 81	4068 16	14869 72	2396 47	10876 93	35471 09
Hinsdale	1792 83	4276 05	15 79	3194 78	. . .	9279 50
Huerfano	1853 42	5106 72	1900 64	2970 00	. . .	11830 78
Jefferson	4514 28	0220 87	10501 87	. . .	4582 24	29119 26
Lake	11966 73	8724 03	13505 01	9908 57	7985 94	52090 28
La Plata	1585 52	6845 72	2655 63	273 53	733 40	12093 80
Larimer	6337 00	11945 22	11644 88	1224 30	5431 14	36582 54
Las Animas	9825 74	9550 51	5692 63	414 92	10768 97	36252 77
Mesa	24 75	4253 59	812 16	. . .	.	5090 51
Montrose	. . .	1263 78	839 70	7880 00	. .	9888 48
Ouray	6489 88	1007 65	3430 02	821 84	250 00	12009 39
Park	3943 60	4238 56	1836 44	41 42	372 22	10432 24
Pitkin	514 09	433 80	. . .	. . .	679 57	1627 46
Pueblo	11682 77	22066 41	4694 51	432 55	56681 97	95556 01
Rio Grande	859 12	2590 56	5358 10	1109 95	404 45	10322 18
Routt	256 00	720 00	. .	. . .	60 00	1036 00
Saguache	1649 96	3731 43	2960 06	. .	1011 85	9353 30
San Juan	606 76	3130 53	. .	. . .	. . .	3737 29
San Miguel	203 00	1032 28	76 51	591 66	3000 00	4903 45
Summit	1213 49	2584 61	2094 01	1117 57	. .	7009 68
Weld	12318 60	24763 63	5390 29	2769 54	24594 14	67836 20
Total	$161034 18	$136903 33	$219784 02	$189925 77	$179941 58	$1087659 18

TABLE VIII.—*Concluded.*

Financial Statement for 1884.

COUNTIES.	EXPENDITURES.					Bal in hands of Co (& Dist) Treas, to credit of District Aug 31, 1884
	For Teachers' Wages	For Current Expenses.	For Sites, Buildings, Furniture, etc	For Temporary Loans paid.	Total Expenditures.	
Arapahoe	128338 34	43923 83	131366 81	9979 19	313608 11	65536 65
Bent	6367 25	1737 29	1706 80	46 44	9857 78	9149 50
Boulder	23219 62	4120 88	5873 52	1697 05	34911 07	4678 30
Chaffee	12886 61	3470 72	2183 91	15 00	18556 24	4612 43
Clear Creek	11992 69	3358 24	642 52	32 53	16025 98	7374 90
Conejos	7931 25	1607 83	2193 84	268 11	12001 03	4618 21
Costilla	2040 00	681 87	249 51	. . .	2971 37	1921 86
Custer	8157 41	1802 51	439 70	130 35	10529 97	1910 48
Delta	1210 43	136 09	336 94	100 00	1783 46	819 72
Dolores	630 00	225 00	730 01	. .	1585 01	794 46
Douglas	5676 84	395 46	1331 53	121 85	7525 68	3821 59
Eagle	1077 12	271 25	482 26	. . . .	1830 63	608 71
Elbert	4417 50	636 12	760 45	65 55	5879 62	4966 93
El Paso	17214 35	3899 71	5807 36	95 33	27118 75	4293 47
Fremont	10759 30	2451 82	1083 56	3494 35	17789 03	6029 28
Garfield	62 44	. . .	. .	. . .	62 44	179 68
Gilpin	14614 08	3372 32	45 47	100 86	18132 73	635 84
Grand	961 96	297 14	36 57	. . . . .	1295 67	620 40
Gunnison	11120 41	6656 66	7046 02	4760 30	29883 39	5587 70
Hinsdale	1890 00	2575 57	3840 86	202 57	8509 00	770 50
Huerfano	6202 06	252 51	588 73	7 29	7050 59	4780 19
Jefferson	14925 20	2722 17	2681 55	4365 80	24694 72	4424 54
Lake	23725 85	10994 14	16660 86	. . .	51380 85	709 43
La Plata	7226 68	844 49	425 69	1327 38	9826 24	2267 56
Larimer	15541 00	5571 65	4684 87	3457 07	29254 59	7327 95
Las Animas	13218 35	2397 30	1091 78	2645 13	19352 56	16900 21
Mesa	1493 00	914 95	725 91	. .	3143 86	1946 64
Montrose	2259 86	352 30	5260 29	. . .	6872 45	3116 03
Ouray	2059 00	687 22	7740 88	761 50	11239 60	769 79
Park	5272 34	1495 69	154 05	. . . .	6922 08	3509 16
Pitkin	354 32	553 17	. .	. . .	907 49	719 97
Pueblo	32250 23	17670 15	8465 48	24785 93	83171 79	12384 22
Rio Grande	4550 25	1844 17	868 96	292 51	7555 89	2766 29
Routt	780 00	27 75		26 00	833 75	202 25
Saguache	4216 64	1218 96	395 79	272 89	6104 28	3249 02
San Juan	1595 00	1008 03	200 00	199 72	3002 74	734 55
San Miguel	310 00	373 25	3632 29	. . . .	4365 54	537 91
Summit	2393 11	1689 35	625 00	. . .	4707 46	2302 22
Weld	24212 56	8093 65	16001 43	8119 98	56427 62	13408 58
Total	$432255 05	$140122 2	$227321 20	$66772 67	$876671 12	$210988 06

TABLE IX.—FINANCIAL SUMMARIES.

1883

	Received.	Paid
Amount on hand September 1, 1882	$128,229 23	
From General Fund	329,408 23	
From Special Fund	269,441 99	
From Building Fund	37,829 37	
From all other sources	227,200 20	
Total receipts	$992,119 08	
For teachers' wages		$367,355 89
For current expenses		117,194 22
For sites, buildings, furniture, etc		267,610 79
For temporary loans paid		96,714 47
Total expenditures		$348,875 37
Balance in hands of County Treasurer, August 31, 1883		143,243 71
Totals	$992,119 08	$992,119 08

1884.

	Received.	Paid.
Amount on hand September 1, 1883.	$161,034 48	
From General Fund	336,903 33	
From Special Fund	219,784 02	
From Building Fund	189 995 77	
From all other sources	179,941 58	
Total receipts	$1,087,659 18	
For teachers' wages		$432,255 05
For current expenses		140,322 20
For sites, buildings, furniture, etc.		237,321 20
For temporary loans paid		66,772 67
Total expenditures		$876,671 12
Balance in hands of County Treasurer August 31, 1884		210,988 06
Totals	$1,087,659 18	$1,087,659 18

TABLE X.

Apportionment of State Fund.

COUNTIES.	1883. 60 CENTS PER CAPITA.			1884. 61 CENTS PER CAPITA		
	Amount Apportioned.	Deducted for Blanks.	Balance Certfi'd to Auditor	Amount Apportioned.	Deducted for Blanks	Balance Certfi'd to Auditor.
Arapahoe	$7,227 60	$45 45	$7,182 15	$8,151 51	$23 42	$8,128 09
Bent	276 60	9 57	267 03	273 89	9 11	264 78
Boulder	1,800 60	82 23	1,718 37	1,926 38	60 45	1,865 93
Chaffee	928 20	33 73	894 47	1,101 05	53 35	1,047 70
Clear Creek	961 80	36 00	925 80	1,043 71	4 07	1,039 64
Conejos	745 80	35 20	710 60	803 37	20 90	782 47
Costilla	542 40	9 66	532 74	. . . .	. .	. . .
Custer	769 80	30 55	739 25	838 75	30 71	808 04
Delta	. . . . .	. . . .	. . . .	148 23	16 18	132 05
Dolores	48 00	. . . .	48 00	41 07	1 58	39 49
Douglas	343 80	17 43	326 37	375 76	16 09	359 67
Eagle	. . . .	. . . .	. . .	93 94	26 10	67 84
Elbert	213 00	12 73	200 27	207 40	14 99	192 41
El Paso	1,231 20	4 70	1,226 50	1,184 01	51 24	1,132 77
Fremont	981 00	44 85	936 15	1,012 60	19 26	993 34
Garfield	. .	. . . . .	. . .	. . .	. . . .	. . .
Gilpin	954 00	30 90	923 10	981 49	16 36	965 13
Grand	118 80	8 00	110 80	142 74	. .	142 74
Gunnison	683 20	95 19	788 01	649 04	16 09	632 95
Hinsdale	134 40	4 80	129 60	140 30	4 78	135 52
Huerfano	964 80	29 85	934 95	1,120 57	7 20	1,113 37
Jefferson	1,154 40	22 28	1,132 12	1,313 33	48 61	1,264 72
Lake	1,561 80	36 55	1,525 25	1,681 77	20 10	1,661 67
La Plata	460 20	7 68	452 52	502 64	47 73	454 91
Larimer	1,057 80	66 96	990 84	1,182 18	42 52	1,139 66
Las Animas	1,817 40	34 73	1,782 67	1,886 73	31 39	1,855 34
Mesa	.	.	. .	150 06	44 10	105 96
Montrose	. . .	. .	. .	71 98	30 35	41 63
Ouray	130 80	10 35	120 45	168 36	3 78	164 58
Park	399 60	5 33	394 27	400 16	12 41	387 75
Pitkin	85 20	28 46	56 74	66 49	1 05	65 44
Pueblo	1,519 20	53 41	1,465 79	1,696 41	82 82	1,613 59
Rio Grande	321 00	3 30	317 70	286 70	16 89	269 81
Routt	. . . . .	. .	.	50 63	33 74	16 89
Saguache	430 20	5 65	424 55	472 75	16 62	456 13
San Juan	43 20	3 50	39 70	95 77	2 10	93 67
San Miguel	. . .	. . .	. . .	66 49	12 35	54 14
Summit	309 00	12 41	296 59	200 69	18 62	182 07
Weld	1,110 00	90 92	1,019 08	1,309 67	44 81	1,264 86
Totals	$29,524 80	$912 33	$28,612 47	$32,038 42	$901 87	$31,136 55

APPENDIX

STATE TEACHERS' ASSOCIATION

1884.

COLORADO STATE TEACHERS' ASSOCIATION,

Tenth Annual Session,

MONDAY, TUESDAY and WEDNESDAY, DECEMBER 29, 30 and 31, 1884.

HIGH SCHOOL BUILDING, : : DENVER.

EXECUTIVE COMMITTEE:

J. S. McClung, Chairman, Pueblo. *Robert H. Beggs, Secretary, Denver*
A. C. Courtney, Denver

The session was a very successful one, the attendance larger than ever before. The papers read were of a high order, as may be seen by the two herewith published:

The following order of exercises was observed:

MONDAY EVENING, DECEMBER 29.

Lecture—"Poetic Justice" . . . . . Rev. Myron W. Reed, Denver

TUESDAY MORNING, DECEMBER 30

President's Address . . . . . David K Boyd, Greeley.
"Unmarked Results" . . . . . Miss Harriet Scott, Pueblo.
"Scientific Temperance Instruction in Schools" . . A B Copeland, Greeley.
General discussion and announcement of committees

AFTERNOON.

"A New Demand' . . . . . F B Gault, South Pueblo
"Philosophy of Teaching" . . . . Miss M A B. Witter, North Denver.
"What Lack We Yet" . . . . Jos C Shattuck, State Supt of Schools.
"Discussion" . . . . . Fred Dick, Trinidad.

EVENING.

Lecture—"The Development of Character" . . . . . Prest. Edwin C Hewitt, Normal, Illinois

WEDNESDAY MORNING, DECEMBER 31.

"The Microscope in the School-room" . . . . . H F. Wegener, Supt Schools, West Denver.
"Theory as Related to Practice in Teaching" Charles A. McMurry, Denver.
"How to Secure a Judicious Cut-Down in Geography" . . . . . Prest J A. Sewall, Boulder.
General discussion.

AFTERNOON

"Selection and Use of Public Libraries" . . . . Frona R Houghan, Denver.
"School Reading" . . . . . E C. Stevens, Alamosa.
"Mistakes in School Management" . . E L Byington, Colorado Springs
"Discussion" . . . . . T. E Irwin, La Junta.
"The Teacher Out of School" . . . . . Aaron Gove, Denver.

Sessions begin at 9 a. m, 2 p. m. and 8 p. m. Discussions will be in order after the reading of each paper

PRESIDENT'S ADDRESS.

"THE ETHICAL IMAGINATION."

David Boyd, Greeley.

In the opening half-hour of your deliberations, which custom assigns to the address of your President, he has concluded on the present occasion to invite your attention to the importance of cultivating in yourselves and the youth under your charge the ethical imagination.

By ethical imagination, I mean that faculty of the human mind by which it represents to itself human actions and their consequences as possible occurrences, and experiences in the presence of these representative or ideal actions, the sensations and emotions that it would in the presence of real actions.

There are three sources of the thrills which agitate our being—sensation, memory and imagination.

Sensation is the response of the mind to an external stimulus. This response the mind is capable of reviving in the absence of the external stimulus.

This is memory: It is living over a past forever vanished as an external reality. At pleasure the mind is usually capable of reproducing these thrills of organism, fuller or fainter echoes of past experiences. But the mind can do more than this. It can experience sensations of emotions corresponding to stimuli, of which past experience only furnished a hint. This is imagination: It is a real subjective world, co-related to an unreal objective world created by the mind out of the hints of former experiences.

These experiences are divided into three classes, corresponding to the true, the beautiful and the good, giving foundations for science, esthetics and ethics. The part played by the imagination in the domain of the beautiful seems alone to have received the attention of thinkers until Tyndall brought into recognition the scientific imagination. But that there is an ethical imagination is just as certain As there is ideal truth and ideal beauty, so is there ideal virtue. As the mind is pleased or pained about truth and error, beauty and deformity, so it is about virtue and vice. Each has created for itself an ideal world.

Science has its pure mathematics, formal logic and supersensible ether, molecules and atoms; esthetics its fine arts; and ethics its literature of fictitious actions and characters.

The home made by the parent for the child alone has an ethical importance equal, or perhaps superior, to the public school. But, alas, we know not how to prevent a multitude of homes from remaining what they have long been, nurseries of vice and crime. Hence I may say to the teachers here assembled before me, "Ye are the ethical salt of the earth." If the savor of virtue be native to you, and abide in you, the prevention of moral corruption may be hoped for.

The significance of beginning ethical training early is shown by the multitude of maxims and proverbs found upon this theme in every civilized language. However, the difficulty of the task expected to be performed by those in charge of the young remains as arduous as ever, and is best appreciated by those who have the most earnestly struggled in this work "Bend the twig and bend the tree" is easily said; but some twigs will break before they bend, and others that will bend and remain bent under a sufficient pressure will immediately resume their native direction when the pressure is removed.

Few children are like a bar of lead, many are like a bar of cast steel, while most are like the tine of an American hay fork. By applying sufficient force in the right direction the tine may be straightened out, but take away the pressure and the tine immediately resumes the shape given in its manufacture. Some teachers will remember certain boys whom they straightened out, but who would not remain straightened. I know how often you have to sigh over the persistent survival of the ethically unfittest of the race, and would be ready to reply to him who would blame you for it, as a certain teacher is said to have very indiscreetly replied to a parent who was finding fault because John did not get on better in his studies. "Sir," said he, "there is one important respect in which the teacher cannot stand *in loco parentis*, and that is in furnishing the pupils brains."

The boy has been very aptly named the savage of civilized society. I fear that we are all born ethically perverse. The Calvanist who teaches total depravity is nearer the truth than the sentimentalist who takes the child character as the type of moral perfection.

All children are selfish, self-willed and cruel, and display these qualities to the extent of their small abilities. Their innocence and purity are the innocence and purity of imbecility. No reasonable man would pray for the coming of the kingdom of heaven whose moral bore any resemblance to child ethics. To such a one the child is interesting as a bundle of possibilities.

All of you, in your endeavor to form the young mind to virtue, have no doubt been struck by the inefficacy of the finest moral maxims and precepts. They have fallen upon your own soul like the dew upon the withered flower. But the reason for the difference is not far to seek. It is the experience of life which has consecrated for you these sayings of the world's sages. They originated in their experience, and can only be fully understood by him who has had it. The child has no such experience, and can only anticipate it through imagination in sympathy with the feeling that animates your tongue and face This it should be able to do, not from a set form of words, however beautifully alliterated into a proverb, but by a narrative whose actions it can simulate. It luxuriates in the realm of make-believe performance. Its imagination is more active in simulating action than in creating objects. It takes delight not so much in mud pies themselves as in the making of mud pies The kindergarten folk understand this propensity of child-nature, and hence their success.

Now this child tendency of living in an unreal, ideal world, instead of being suppressed, should-be encouraged, directed and prolonged as fast as possible into the adult life. Through the whole journey of life it offers us great possibilities. The finest joys of the finest natures, the purest happiness of the choicest men and women, spring up, bud, blossom and fructify in this realm of the ideal. We do not ask as a test of a fine nature what wine a man likes, or what brand of cigar, or what fish, flesh or fowl, but what poem, or what novel delights him. Indeed, will we, will we? The far greater part of the life of even the adult must be passed in this world of imagined experiences. They may be high or low, gross or refined, and they will give tone to our conversation and conduct. What they are in youth and after life will depend much on the home and school training. As the child readily takes its opinions from another, so it may be easily led by another to form its ethical ideal. Fictitious narratives about other children is the best means of gaining the end. It must be fictitious, because as all real children are very naughty you must invent your models, or take those that you find at hand already invented. These models must find happiness, joy, delight in well-doing. Your success will depend on your histrionic ability—that is, upon the penetrating power of your expression. Says Horace: "If you would have me weep, you must yourself shed tears."

The generous, the magnanimous, the disinterested deed must appear to fill you with a glowing enthusiasm. The sense of your appreciation will sparkle in your eye, flush on your cheek, tremble on your lips and thrill in your voice. Children are readily led by sympathy, and will experience with you your loves and hates, your approvals and disapprovals. It is just as important that you show yourself a good hater of the mean as a warm lover of the generous. Attempt no foolish compromise here, pretending to have some false sentimental love for the man, the person, while you detest his character. Eliminating from the equation some 150 pounds, more or less, of solids and fluids identical for us all, the character is the man, the person. The child cannot understand your fine spun distinction; nor in reality does the distinction exist. It is a fiction invented to reconcile rational morality with certain impracticable moral precepts, such as "Love them that hate you and despitefully use you, and say all manner of evil concerning you."

However, it is better to dwell upon the loveable in man than the hateful, for hate, like care, corrodes the heart and tends to make us unamiable and misanthropic Besides, rightly viewed, it is the goodness in humanity and not the evil that is to be wondered at. Selfishness, cruelty, and immodesty we have in common with other animals; while disinterestedness, kindness and modesty are peculiarly human characteristics. What is lowest in our nature is easily explained on the theory of inherited tendency. The comparative ethical inferiority of the child nature is also easily explained by the theory of evolution. Embryological research shows that the human organism passes successively through structured changes, corresponding in its leading features with the development in time of the animal series. Analogy would lead us to expect that functional evolution would follow the same order. At birth structural metamorphosis is nearly complete, while independent functional existence in only then beginning. In accordance with this analogy we find that the child's first functional activities are purely animal. As the organic germ inherits the tendency to build up the organism after the parental type, so the infant organism inherited the tendency to perform the functions necessary to complete and preserve the organism. The love of life is a *sine qua non* of living. An individual or race deficient in this propensity would soon succumb amid the fierce struggle for existence everywhere going on in nature. The tendency to take a vigorous part in this struggle has been inherited by us through a long line of savages, if we are not allowed to say brute ancestors The fact of man's victory in the struggle implies the energy, skill and audacity of man's self-assertion. Hence, as we said, the wonder is not about man's self-assertion and self-indulgence, but concerning why and how he has succeeded in making a partial escape from the dominion of these powerful tendencies.

In order that the child may be led to form for itself a fair, fascinating ethical ideal in harmony at once with its affection and with the principles of human well-doing and well-being, it must be led in a path that it understands, into an ideal world of beauty and virtue whose actions it can take part in and appreciate As in teaching knowledge, we should begin with the near and known, and gradually help it to reach out to the unknown and far, so in our attempt to fascinate it with the beauty of virtue, we must lead it through activities lying close to its own young, narrow life. It should begin with child life, its plays and its pleasures, its griefs and its perplexities. Next it can be introduced into the activities of youth and adult life, such as lies near it and immediately under its observation. Sooner than some of us old folks think we are studied and seen through and our actions weighed and classified by the little folks.

The point to be brought out in all these fictions of life should be that it is more manly to help than to hurt, to help than be helped, and that the finest pleasure is derived from the endeavor to make others happy.

That the persons introduced in the narrative may have a vital influence upon the life of the child, they must be genuine human beings, neither helped nor hindered by any superhuman beings or agencies.

The supernatural aid received by the heroes of the Iliad, and the semi-divine genesis of some of them, lessens our interest in their prowess. We sympathize with each of them just in proportion to their strictly human origin and energy. The divine Achilles, invulnerable by being dipped in the Styx by his goddess mother, Thetis, and armed and armored in panoply manufactured by the god Vulcan, sinks into contempt by the side of the Trojan, Hector, thoroughly human and relying solely upon human armor and native human courage.

The Hebrew Psalms, prophecies and proverbs contain some of the loftiest ethical utterances to be found in literature, and the practice of having the young commit to memory some of the gems of Hebrew ethical literature is excellent. In this way there is created for the young an ethical standard quite at variance with their ethical ideal. The one is creation of adult reason, which we have been taught to believe, pretend to believe, and often even think we believe, but away from which the affections are averted; the other a beautiful goddess which we disown, but which we worship in our heart of hearts.

The moral battle of life lasts as long as these two conflicting ideals usurp our allegiance. In their reconciliation and unification we have peace. It may be the peace brought on by moral death, or the peace wrought out by us, struggling in the path of duty, "on with toil of knees and heart and hands, through the long gorge to the fair light," which illumines "those shining table lands, to which our God" (the unified, perfected, ethical ideal) "is moon and sun." The conquest consists in winning over the affections to the love of virtue embraced as the supreme good. Says Seneca, "We do not love virtue because it pleases us, but virtue pleases us because we love it." And Marcus Aurelius, "To ask to be paid for virtue is as if the eye demanded a reward for seeing."

The ethical end is met when we find our supreme happiness in making others happy; the other end, whatever we call it, is reached when we find our chief pleasure in making others miserable. The first secures the complete reconciliation of public and private ends; the second sets up their complete antagonism.

We see that the moral magnet has two poles, at the one happiness for him who makes happy, at the other a fiendish satisfaction in making others miserable. Few have reached either goal. We are mostly either climbing upward to the one, or crawling backwards to the other. Few have reached Bunyan's land of Beulah, and none Dante's "Inferno," whose gates bore the inscription, "He who enters here leaves hope behind." He who climbs may crawl, and he who crawls may climb. Teachers, it is your privilege to start the coming race a climbing. To succeed you must be sure you are yourselves climbing. "Honor the truth by use." Your own lives will radiate sweetness and light in proportion to the firmness and strength of the ethical ideal you have succeeded in enshrining in your hearts. If the prevailing tone of your minds be "it is better not to be at all than not to be noble," it will radiate from the countenance as the divine effulgence is said to have beamed from the face of Moses, fresh from talking face to face with the ineffable brightness.

Some one has called the hope of posthumous fame the most refined and supersensual of all that can be called reward, yet a still more refined and supersensual reward because refined of all selfishness. It is the hope of living.

In other minds made better by your presence,
In pulses stirred to generosity,
In deeds of daring rectitude, in scorn
Of miserable aims that end in self;
In thoughts sublime, that pierce the night like stars,
And with their mild persistence urge men's search
To vaster issues
May you reach that purer haven
And be to other souls that cup of strength
In some great agony; feed pure love,
Beget the smiles that have no cruelty;
Be the sweet presence of a good diffused,
And in diffusion ever more intense,
So you may join the choir invisible,
Whose music is the gladness of the world.

So far I have but hinted at the method of quickening the ethical imagination in the young. We will now speak of perfecting it in yourselves, which will also apply to the more advanced pupils.

For ethical purposes mathematics and science are about as good as worthless. History has two very distinct lessons for us. The one relates to the rise, growth and influence of institutions and phases of thought; the other to individual conduct and the formation of character. Writers will value the one or the other of these elements in proportion to the relative importance which they attach to knowledge as compared to character. Hence we find Buckle excludes biography from the domain of history, while Emerson says, "There is properly no history, only biography." Biography may be said to be the stuff from which the ethical imagination forms its ideal character. This study constituted the greater part of the education of the Roman youth. Says Plutarch in his "Hints to Virtue:" "Whenever we begin an enterprise, take possession of a charge or experience a calamity, we place before our eyes the example of the greatest men of our own or bygone ages, and we ask ourselves how Plato, or Epaminondas, Lycurgus or Agesilaus would have acted, seeing these persons in our minds as in a faithful mirror, we remedy our defects in word and deed." It was with this end in view that Plutarch wrote his "Lives," a work which has had an immense influence in forming the character of the great men whose lives have adorned modern civilization. However, there is now within our reach a biographical literature of more importance to us. The nearer a man's life is to our own the more will a study of his influence ours. Hence, first of all, Americans of our own age, and so receding in time and space. Macaulay called Plütarch a charming writer, but still only a romancer. Had his delineations been more literally true they would have no doubt been much less effective. Since we all are prone to say, "what others have done I can do," it is well to have the highest achievement for example. Into the biography that is the most tonic for us there always enters some fiction. Macaulay remarks that it is a proof of the intrinsic greatness of Sam Jonson's character that even the minute shadowing of Boswell could not make it contemptible We all know how the utter truthfulness of Froude has taken down from its pedestal the imposing character of Carlyle.

How different from the one Swinburne drew for him in these four lines:

Storm God of the northern foam,
Strong, wrought of rock, to breast and break the sea,
And thunder back its thunder, rhyme for rhyme,
Answering as tho' to out-roar the tides of time.

This leads us to observe that the best models are pure fictions. As long as they remain genuinely human, the finer and stronger the better. If the art be high there is but little difference whether it be in prose or in verse. When the culture and experience of life will it avail, then the words of sages like Emerson or Carlyle may be read and pondered.

More than reading the words. of the absent and departed is the conversation of a friend who is yearning for more light, and a fuller, overflowing life. Such a one is not to be met at every step of our lives, nor will the all-compelling circumstance allow our. paths long to lie parallel.

There is one direction in which the ethical imagination was cultivated to an extraordinary degree, and that was in anticipating the rewards and punishments of a future life. Even in quarters where these rewards and punishments are still believed, there are now no such efforts being made to paint to the imagination the terrors of the one or the felicities of the other. In other quarters there is a very decided decline in the belief both about any rewards or punishments, and about there being any hereafter or any power outside of natural causation to punish either here or hereafter. Some deplore this and point to a like decline in faith about the supernatural accompanying the moral decadence which brought about the fall of the Roman empire. It is said that history repeats itself, and that there are signs that a like demoralization is now going on *parri passu* with a decline in religious belief.

In answer to this we can point to the fact that in periods of the greatest demoralization there was to be found side by side with it a philosophic morality never surpassed for the grandeur of its conception, or the lives and characters of its followers. Those ages produced a Marcus Aurelius on the throne, and Epictetus, the slave of cruel master, yet the author of writing which that emperor thanked Providence for having access to.

True, this philosophy failed to reform the masses and save the empire. But so also did Christianity with all its allurements and terrors of a future life. It is then pertinent to ask what we have to save the masses which Rome did not. I answer two things in particular: The printing press and the free common schools. The last especially, for the press, though generally on the side of right and virtue, is too apt to print what pays. But if the common schools save the nation it will not be by means of the multiplication table, or a knowledge of the law of gravity. Under the fierce electric light of science old faiths are fading and the motives of life are changing with them, but all that was ever made truly for righteousness still remains. Those were brutal and blind ages, when the "fear of hell was a hangman's whip to hold the wretch in order," and it had no great efficacy in doing that. The more refined motives for action still remain. It is your mission to lift the life of the masses to a higher, healthier plane, where these more refined motives may guide their feet into paths of righteousness. It is for you to prepare the heart for the beauty of holiness, the grandeur of generosity and magnanimity, the serene majesty of utter truthfulness.

THE MICROSCOPE IN THE SCHOOL-ROOM.

H. F. WEGENER, DENVER.

It has been said that he who makes two blades of grass grow where formerly only one grew is a benefactor of mankind. Equally true I believe it to be of the teacher who, besides teaching his pupils how to read, write and cipher, can also awaken in them a bent or inclination which, in its prosecution in after life, shall be to them not only a source of pleasure and recreation, but also a means of self-education.

Curiosity is a trait of human nature especially active in childhood. Children are always ready and willing to see things. To develop this curiosity in pupils to such an extent as to lead them to look deeper than the mere superficial form; to cultivate a habit of seeing and discovering all that can be seen about an object, and then to collect and arrange the knowledge thus gained in a tangible and available form, should be the basis of all true teaching.

A desire to indicate one way in which this can be done is the object of the present paper. I have chosen the microscope as the means, because no other instrument enters in its investigations into the affairs of every day life at so many points as this does. In our work during the past term time did not permit us to follow more than one line of study methodically. We, therefore, chose as a course the growth and development of the lower forms of animal and vegetable life.

One of the simplest and easiest studies, and one which will give most striking practical results, is a study of that very common, yet very little understood substance called yeast. With this we began our course. I required each member of my class to bring to school a small quantity of yeast, some in the fluid form and some in the dried form. I also requested that each pupil supply himself with four or five clean bottles. These, with some Florence flasks, test tubes and a microscope, completed our apparatus. We first observed the general appearance of yeast in its fluid state. That bought at the baker's is usually of light brown color, containing more or less solid material. We strain off the latter. Four bottles, marked 1, 2, 3 and 4 respectively, were prepared. Into the first one a solution containing sugar was poured, and then a little yeast added. This is put in a warm place, and we await results. The mixture soon begins to disengage bubbles containing gas. Its sweetness gradually loses itself, and a vinous flavor takes its place. From this liquid alcohol can be obtained by distillation. Another bottle, numbered 2, is partly filled with the same solution as before, but, before adding the yeast, we pass the latter through a very fine filter. This bottle is now allowed to stand under the same conditions as the first one was, but no change takes place. A third bottle, containing the same solution, *but not corked*, is allowed to stand in the room with the yeast, but none is added. After a few days we observe bubbles beginning to rise, a sign that yeast has gotten into it, and that it is beginning to work. In our fourth bottle another portion of sugar solution is placed, and some yeast added. Now, this solution we boil, and, whilst it is boiling, we fit into its wide neck a plug of cotton. We set this also in the neighborhood of the yeast, and then wait But we wait in vain. No change is apparent.

Four facts have thus been learned regarding the nature of yeast Let us sum them up. By the first experiment we discovered that if yeast is placed in contact with a fluid containing sugar it induces a chemical change, by which the sugar is decomposed, principally into carbonic, anhydride and alcohol. The second experiment taught us that this something which induces the chemical change can be filtered off from the containing fluid, whilst the third experiment informed us that these particles float in the air, and that they can be filtered out by passing the air through cotton. In the fourth and last experiment we gained the knowledge that the efficiency of yeast is destroyed by heat. The question, What are these particles that they can produce such mysterious changes? remains to be answered.

And now we will call upon our microscope to assist us in finding the answer. A drop of yeast is placed on a glass slide and covered with a thin cover glass. The microscope is adjusted with a moderately high magnifying power. With the drop of yeast on the stage of our instrument, we take a look through the tube. What do we see? A number of round or oval transparent cells are seen floating before us. Some are single, others arranged like a string of beads, whilst still others show a large cell with one or two small cells attached. The large cell we may call the mother cell, the smaller ones are daughter cells. Each cell is composed of a thin walled sac, enclosing a granular fluid. The sac is the cell wall, the contents is protoplasm. The average size of these cells is about $\frac{1}{3000}$ of an inch Chemical analysis has determined its composition to be made up of carbon, hydrogen, nitrogen, sulphur, phosphorus, potassium, magnesium and calcium. In order to determine whether these cells are living organisms, we shall have to perform another experiment. For this purpose I had prepared one of Pasteur's culture fluids. In a portion of this fluid we placed a small quantity of yeast, and examined it with the microscope. We see only a few isolated cells here and there in the fluid. We allow it to stand in a warm place over night. Next morning we examine the contents of our bottle again. The surface of the fluid is covered with a frothy scum. This scum, upon examination, is found to consist of an immense number of yeast cells, which have grown during the night. We, therefore, conclude that these cells are living cells, for only living organisms can grow and multiply. But we have also discovered *how* they grow. When we examined the contents of our bottle in the evening we saw only a few single cells. Now we see a great many cells with smaller cells attached. These cells, therefore, multiply by budding. Each bud in turn becomes the parent of another bud, until we sometimes see six or seven cells joined together. Each cell is a perfect individual, and represents one generation.

One more question remains to be answered. We have not yet determined whether the organism is a plant or an animal. Our culture fluid will help us to solve the problem. This fluid is a solution of the inorganic salts, ammonium tartrate, potassium phosphate, calcium phosphate, magnesium sulphate and sugar, the whole dissolved in distilled water. In this we found the yeast plant will grow very vigorously.

As the cell consists of cellulose and its contents is protoplasm, neither of which we placed in the fluid, we are led to the conclusion that these cells are plant cells, for only plant cells have the power of taking up from the surrounding fluid the inorganic salts and constructing out of them such organic compounds as protoplasm.

We can classify it still further. We know it is a plant. To what division of the vegetable kingdom does it belong? It contains neither starch nor chlorophyll. It grows without requiring sunlight. It absorbs oxygen and gives off carbonic anhydride, all properties which are *not* characteristic of green plants. But these *are* the characteristics of another class of plants called fungi.

I have now presented with more or less detail our first study. Although I have omitted some particulars, enough has been indicated to give a comprehensive view of the plan. Every experiment and every observation was made by the pupils themselves.

The knowledge which they gained was derived from phenomena observed with their own eyes, and worked out by their own hands.

The practical bearing of the results was thoroughly understood. The girls of the class were particularly interested in this subject; practically familiar with it, they had never known its nature nor the conditions which favor its growth They had now been supplied with the means of solving for themselves that seemingly inexplicable mystery which so often puzzles and aggravates our good housekeepers—an obstinate batch of dough.

To them the cause and prevention of fermentation in preserved and canned fruits is no longer a matter of tradition, but rests upon a knowledge obtained by personal observation.

As the yeast plant is the simplest type of the *non*-chlorophyll bearing fungi, so protococcus is the simplest type of that large class of *green* or chlorophyll bearing plants. This, then, formed the subject of our second study. To avoid tediousness, however, I will omit details and give only results.

My pupils explored water-troughs, mud holes and ditches to supply the necessary specimens for observation. Like the yeast plant, the protococcus consists of a single cell, composed of a cell wall and a granular protoplasm, but instead of being transparent and colorless, it has diffused through its mass granules of coloring matter, generally green, but occasionally half green and half red, sometimes wholly red. We found the yeast plant to multiply its cells by budding. Protococcus multiplies by dividing each cell into two cells. Protococcus requires sunlight for its development and growth. The yeast plant does not. The latter gives off carbonic anhydride, and absorbs oxygen. Protococcus *absorbs* carbonic anhydride and gives off oxygen, when exposed to sunlight.

One peculiarity of this plant is its motile stage. During this stage it possesses two long filaments—projections of protoplasm—called cilia. By means of these it can move very rapidly through the water, and thus be easily mistaken for an animal.

In our next study the proteus animalcule permitted us to observe the simplest manifestations of animal life, and to note the conditions of its existence.

We chose the bacteria for the fourth study, because in our current literature we frequently meet with allusions to them in connection with the cause of contagious diseases. As some very conflicting notions prevail regarding their nature I thought it desirable that we should observe some facts about them. Pasteur's culture liquid and diverse infusions furnished the means. We learned that bacteria are organisms belonging to the vegetable kingdom. They have a great variety of forms. They are the cause of all putrefactive fermentation. No decay of organic matter takes place without their presence. They are so extremely small that they require the highest power of the microscope to discern them. They float in the air, but can be filtered off by means of cotton. A temperature of 140 deg. destroys their vitality.

In the study of moulds we first met with that singular form of reproduction called alternation of generation.

A view of the streaming motion of the protoplasm in the vegetable cell, sometimes miscalled circulation, gives a reality to our conception, which no amount of descriptive text could impress so well.

Definite ideas regarding the characteristics of a cryptogamous plant and the differentiation of cells to form tissues can be most readily acquired by a careful study of the structure and life of a fern.

By means of thin cross-sections of the rhizome the microscope will reveal its beautiful scaloriform and spiral vessels. The brown patches on the under side of the pinnules are seen to be bunches of translucent cells full of minute bodies called spores. The growth and development of the prothallus of the fern and the discovery of its function is always a source of wonder and surprise.

A quantity of duckweed gathered by my pupils one day, from a pool of clear water close by, gave occasion for more expression of astonishment and delight than anything which so far had been discovered. On the stems of these tiny plants are found whole colonies of vorticellæ, wheel-animalcules and green hydræ.

Whoever has observed a wheel-animalcule in its native element, when exposed to sunlight, with all its beautiful transparent organs in rapid motion, can form some idea of the effect which such a wonderful spectacle has upon a young mind to whom it is presented for the first time. Our hydra, too, seemed to catch the inspiration of the occasion, for it filled its spectators with amazement by sending out a bud from its body, and developing it into a complete counterpart of itself—tentacles and all—in the short time of twenty hours.

Here we have another instance of multiplication by budding, but in this case it is an animal instead of a plant.

In the study of human physiology, the circulation of the blood through the capillaries is seldom clearly comprehended by ordinary pupils. We can illustrate this beautifully by a living animal.

For this purpose I asked my boys to secure for us one of those nocturnal vocalists whose discordant notes so frequently break the monotony of a balmy summer evening.

The translucent membrane found between the toes of his foot, when spread out on the stage of the microscope, gives a most excellent view of the movement of the red blood discs through this net-work of minute tubes. Both the arterial and venous flow can be seen at the same time. But while it serves to illustrate a physiological function, it can also be made to exhibit a pathological condition: namely, the state of the capillaries during an inflammatory process. If we place a few grains of mustard on the moist membrane as it is stretched out before us, a change in the motion of the blood discs soon becomes apparent. Instead of continuing to pass through the tubes singly, they now begin to crowd through, in much greater numbers, giving to the membrane a much redder appearance. This is due to an increase in the diameter of the tubes. The irritation produced by the mustard causes the muscular fibres surrounding the blood-vessels to become flaccid, and they, therefore, allow more blood to enter the vessels.

Another change is noticeable. The blood flows slower and slower, until finally complete stagnation ensues.

We have now before us a perfect inflammation of the frog's foot. A precisely similar condition obtains in an inflammation of any organ of the human body.

If such a condition were continued for any length of time, it is obvious that serious structural changes must result. We, therefore, remove the mustard and keep the membrane moist until the flow of blood is fully reestablished. In consideration of the interesting lesson afforded us by our subject under the microscope, and as we owe him no grudge, he is returned to his favorite element, where he will, no doubt, be the hero among his amphibious colleagues.

Many more examples could be cited to illustrate the numerous uses to which the microscope can be put. But I determined to indicate only an outline of my own experience with the instrument as an adjunct in school work.

No time which I have ever spent in the pursuit of information or knowledge has yielded me so much genuine pleasure and such fruitful results as the time spent with this instrument.

But its value does not lie wholly in the immediate knowledge which we gain by its use. It excites in us a desire to go farther than mere external appearance. The curiosity to know something about the nature of an object, its life, and the conditions which brought it into existence, leads us, unconsciously, to become independent observers

My observation and experience has led me to believe that the teacher who has stored his mind with accurate and positive knowledge, and has this knowledge in an available form, can do better teaching, can secure more satisfactory and happier results, than he with whom a certificate and a school is the climax of his ambition.

RESOLUTIONS.

The following resolutions were reported by committee and unanimously adopted:

Resolved: That we thank the Board of Education of District No. One, the railroads and hotels, and the Denver University, for favors extended; the executive committee for their work in the interests of the Association, and Doctors Hewitt and Reed for their lectures.

Resolved. That a periodical published in the interests of the schools of Colorado and affording a medium of instruction and communication between the State Department of Education and the several school boards throughout the State is desirable.

Resolved: That the Hon. H M. Hale, with two others whom he may appoint, shall constitute a committee the duty of which shall be to prepare and print a pamphlet embodying a history of the schools of Colorado, and especially a history of this Association now just completing its tenth year of life; and that said committee be hereby empowered to draw on the treasury of this Association to the extent of $200 to defray expenses, said money to be refunded from the proceeds of the sale of said pamphlet.

Resolved: That it is the decided sense of this Association that the true aim of education is the development of character; that the culture of the heart should never be subordinated to that of the head—the training of the conscience to the training of the intellect—and that in realization of this aim we recognize as the most potent factor a true Christian morality, embodied in the character of the living teacher and pervading and guiding all the work of the school.